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IMPERIAL BUREAU OF ANIMAL HEALTH

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DISEASES CAUSED BY BACTERIA AND FUNGI

STABLEFORTH, A. W. (1938). **Streptococcus Infections of Animals and their Treatment.**—*Vet. Rec.* **50.** 1203-1214. 1 table.

Streptococci can be differentiated by morphology, by fermentative or enzymic properties, by lysis of erythrocytes, and by serological or antigenic characters. On a serological basis it has been shown that streptococci fall into broad groups related to their habitat. Thus nearly all the pathogenic streptococci of man belong to Group A, those from chronic bovine mastitis to Group B, those from horses to Group C, and those from dogs to Group G. Streptococci of Groups E to K are usually non-pathogenic. Several of these groups contain a number of serological types, and some overlapping may occur.

The only important streptococcal disease of bovines is mastitis. This may be caused by several groups of streptococci. The common chronic type is due to *Str. agalactiae* of Group B, more acute streptococcal types being caused by *Str. dysgalactiae* and *Str. uberis* (Diernhofer) and the haemolytic streptococci of Groups A and C.

In equines, streptococci have been incriminated in pneumonia, abortion, joint-ill, and chronic metritis. So far, all streptococci from horses have fallen into Group C without overlapping.

In dogs, haemolytic streptococci are associated with tonsillitis, otitis media, sterility, puerperal fever, acute adenitis, septicaemia and cellulitis. The majority of strains belong to Group G, but a few fall into other groupings.

Apart from symptomatic and palliative measures, the control and treatment of streptococcal diseases lies in segregation of the infected animals, vaccination, and chemotherapy. Much information is required before control by segregation can be regarded as sound. Vaccines in general have proved disappointing. For local chemotherapeutic treatment, the acridine dyes and flavines have proved very successful. Internally, sulphanilamide has given protection against Group C streptococci, and clinical reports suggest that it is effective also against Group G. The drug is well tolerated by domestic animals.—D. D. OGILVIE.

MÉSZÁROS, I. (1936). Adatok a *Streptococcus mastitidis* differential-diagnostikai tenyésztéséhez. [**Selective Cultivation of** *Str. mastitidis*].—*Közl. Oesszehas. élét- és kortan Köréből.* **26.** 536-542.

In experiments on 900 milk samples M. found that cultivation on agar plates containing bromcresol purple, saccharose, and " serum-alkali-albumin " was a very reliable method for the demonstration of mastitis streptococci. The medium

can be stored in closed bottles for a considerable period (four months in the case of M's experiments) without any change in quality. The organisms will grow on the medium at room temperature ; in this case, however, the characteristic yellow area surrounding the streptococci is produced somewhat later than in incubated cultures, and does not appear for 22-25 hours.—G. SÀLYI (BUDAPEST).

SPANEDDA, A., & ONANO, F. (1937). Sull'organotropismo degli streptococchi. [**Organotropism of Streptococci**].—*G. Batt. Immun.* **18.** 329-352. 1 fig. [English, French, and German summaries].

The authors attempted to induce tropism for a given organ in streptococcus strains isolated from patients free from complications or secondary localizations of infection, by repeated passage *in vitro* in media prepared from the organ concerned. They further attempted to re-establish by the same means tropism considered to be latent in strains isolated from certain organ lesions. The results were positive in 25% of all cases in both series of experiments.

DE BENEDETTI, M. (1937). Ricerche sul potere fibrinolitico di streptococchi isolati da focolai morbosi di uomo e di animali domestici. [**Fibrinolytic Power of Streptococci of Human and Animal Origin**].—*G. Batt. Immun.* **18.** 56-60. [English, French and German summaries].

On the grounds of their fibrinolytic power, their capacity to hydrolyse saccharose, maltose, glucose, lactose, levulose, and mannite, and their resistance to bile, the author divides seven tested strains of *Streptococcus scarlatinae* isolated from scarlet fever patients into three distinct groups. Since, however, this grouping did not coincide with that based on the serological tests of the strains, he does not consider it of diagnostic value [see also *V. B.* **7.** 312].

LEMAR, J. D., & GUNDERSON, M. F. (1938). **Fibrinolytic Activity of Streptococci of Human and Animal Origin.**—*J. Bact.* **36.** 569-570.

The fibrinolytic activity of 70 strains of streptococci from superficial infections in animals, including the horse, cow, sheep, pig, g. pig, rabbit, fox and chicken, was compared with that of 40 strains of human streptococci. Fibrin from various sources was employed from man, the horse, ox, pig, sheep, dog, g. pig, rabbit, pigeon and duck. The animal streptococci were active against all fibrins, most markedly against human, and least against horse and pigeon fibrin. Fibrinolysis occurred progressively up to 96 hours with most strains. Species pathogenicity could not be correlated with specific fibrinolytic power.—R. O. MUIR.

PENSO, G. (1936). Panoftalmite epizootica del coniglio a etiologia streptococcica. [**Epizootic Panophthalmia of Rabbits**].—*Azione vet.* **5.** 439-442. 2 figs.

Ophthalmia developed in two batches of rabbits, both of the same origin ; they had been received for experimental purposes at P's laboratory. Some died, while others recovered but became blind.

P.M. there was peritonitis with a sero-haemorrhagic peritoneal exudate, and there were similar changes in the pleura and pericardium. Gram-positive haemolytic streptococci were found in purulent exudate from the eye. The cultural characters in liquid and solid culture media are described ; there was no liquefaction of gelatin, milk was coagulated in 3-4 days, and there was no growth on potato.

Serum from the surviving animals agglutinated the streptococcus. Subcutaneous injection of 0·1 c.c. of broth culture given subcutaneously killed rabbits in 8-12 hours.

I. VON BORMANN, F. (1937). Hautreaktionen mit Filtraten der Staphylokokkenbouillonkulturen. [**Skin Reactions to Staphylococcus Filtrates**].—*Zbl. Bakt. I.* (*Orig.*). **140.** 97-99.

II. FLAUM, A. (1938). **Studies in Staphylococci and Staphylococcal Immunity.** *Acta path. microbiol. scand.* Suppl. No. 35. pp. 137. 57 tables. [Numerous refs.] [In English].

I. A discussion of staphylococcus skin reactions considered as pure toxic and pure allergic phenomena.

II. A lengthy, experimental review of present-day knowledge of the genus *Staphylococcus*. Recent fundamental research on this group has been repeated experimentally and the following conclusions are recorded. F. considers that it is probably quite justifiable to classify strains as pathogenic if they coagulate rabbit plasma and ferment mannitol. The existence of distinct α- and β-toxins is confirmed, and it is stressed that, whereas α-toxin is only formed in the presence of CO_2, staphylococci do not require an increased CO_2 tension for the formation of β-toxin. It is possible to separate α-toxin from an $\alpha\beta$ complex by heating.

The immunological significance of the α and β antitoxins was studied and it was concluded that these antibodies have no bactericidal effect whatever. On the other hand, the presence of α- or β-toxin can reduce the natural bactericidal power of normal serum. This phenomenon is due apparently to their leucocidal effect. From the foregoing it is concluded that any benefit which may accrue from toxoid immunization depends upon the protective action of the antileucocidins produced during the process.—E. J. PULLINGER.

HABS, H. (1937). Zur Frage der Enterokokkentypen. [**Types of Enterococci**]. —*Zbl. Bakt. I.* (*Orig.*). **140.** 94-96.

The ability to produce acetylcholine is a useful factor in the identification of enterococci, since only a limited number of varieties of organism can do this. Other acetylcholine-formers besides enterococci have been described, particularly in silage, but enterococci can generally be separated from such forms by their ability to split aesculin, their development in broth and litmus milk, and their bile-resistance. Enterococci do not all behave characteristically in all these tests, but strains can generally be identified if they behave characteristically in the majority of tests. Actually the enterococci can be divided into two main groups, namely the acetylcholine-formers which grow best in medium made from vegetable matter, and the non-acetylcholine-formers, which will tolerate animal protein. No acetylcholine-forming enterococci have been found to have any pathogenic action. —E. J. PULLINGER.

KRANEVELD, F. C., & DJAENOEDIN, R. (1938). De beteekenis van het cultureele onderzoek bij het stellen van de miltvuurdiagnose. [**Importance of Cultural Diagnosis of Anthrax**].—*Ned.-ind. Bl. Diergeneesk.* **50.** 206-210. 3 tables. [English and German summaries].

A comparison was made of the cultural and biological tests for anthrax, using sticks of plaster of Paris soaked with anthrax blood from goats which had been dead 24, 36, 48, 60 and 72 hours. It was found that the animal test was still necessary even when three plates were sown. For cultural diagnosis the glucose-blood-agar plate method (Zeissler) was found more reliable and rapid than the plain agar plate alone.—JAC. JANSEN (UTRECHT).

PAGNINI, U. (1936). Sulla biologia del B. anthracis. A proposito dell' articolo di J. Basset : " La Bactéridie charbonneuse en culture anaérobie " (" C. R. de la Soc. de Biol.", T. CXIII, 1933, p. 786). [**The Biology of** *B.a.*]—

G. Batt. Immun. **16.** 876-885. [8 refs.] [English, French and German summaries].

P. found as a result of experiments, that, contrary to BASSET's findings [*V. B.* **4.** 200], *B.a.* will not produce spores in strictly anaerobic cultures, though it does grow scantily and loses its Gram-positive character.

WEIDENMÜLLER, H. (1937). Desinfektionsversuche bei Milzbrand mit Stoffen, wie sie im Ablauf des Gerbprozesses benützt werden oder abfallen. [**Disinfectant Trials with Tanning Materials on Anthrax Bacilli**].—*Münch. tierärztl. Wschr.* **88.** 409-416. 13 tables. [Numerous refs.]

Anthrax can be spread during and after the process of tanning hides by the discharge of bacilli into the rivers with the tannery waste, by manure composed of the sludge from tanning pits and through the medium of tanned leather.

W. carried out tests on the viability of anthrax bacilli during tanning processes. Pieces of silk infected with *B. anthracis* were still infected after being passed through the whole tanning process together with hides. Infected silk threads steeped in a mixture of lime and sodium sulphide were still virulent up to 46 days. Such threads immersed in pickling solutions composed of salt, sulphuric acid and water remained virulent for as long as 114 hours. Placed in chrome tanning mixtures they were still infective for as long as 118 hours, for 112 hours in the supernatant fluid, and for 136 hours in the sediment. In chromalum mixture the bacillus survived for 27 days and in "chromosal" mixture for 22 days. Infected threads, placed in tanning mixtures which were put into a pit and allowed to separate into a sediment and supernatant fluid, were infective for 41 days in the sediment and for 32 days in the fluid. The addition of milk of lime to tanning sediment shortened the time of survival of anthrax bacilli therein. It is therefore recommended that milk of lime should be added to tanning pit sediment before it is sold for fertilizing purposes.—A. W. MÖLLER.

NAIK, R. N. (1938). **Dissemination of Anthrax Infection through Dirty Stagnant Pools.**—*Indian J. vet. Sci.* **8.** 243-245. 2 figs.

Anthrax is enzootic in most districts of Bombay province. The disease is more commonly observed during the grazing season, but is by no means rare during April and May when no grazing is available.

In an attempt to trace the source of infection during the non-grazing period, samples of water were taken from two stagnant pools at which animals were watered, and 5 c.c. samples were injected into g. pigs. One g. pig died in three days, and its heart blood sown on agar gave a pure culture of *Bacillus anthracis*.—F. J. ANDREWS.

CARCIA, J. A. R. (1936). Estudo comparativo dos métodos de Ascoli, Sobernheim e Hruska, para a verificação do poder terapeutico do soro anti-carbunculo hemático. [**Titration of the Potency of Anti-Anthrax Serum**].—*Repos. Lab. Pat. vet., Lisboa.* **3.** 115-123. 5 tables. [English and French summaries].

From experiments on 114 guinea pigs and rabbits, on which he compared the methods of Ascoli, Sobernheim, and Hruska for the determination of the potency of four anti-anthrax sera (two of Portuguese and two of foreign origin), C. was of the opinion that none of these methods was capable of giving potency evaluations which might be accepted internationally. He considers, however, that until a satisfactory method has been evolved, preference should be given to that of Sobernheim.

THIJN, J. W. (1938). Een morphologisch bloedonderzoek bij tuberculose van het rund. **[The Blood Picture in Bovine TB.]**—*Tijdschr. Diergeneesk.* **65.** 8-25. 1 table. [13 refs.] [English, French and German summaries].

A detailed account with protocols of the blood picture of 12 healthy and 25 tuberculous cattle. The changes in the latter were not striking, but affected animals usually had " degenerative anaemia ", and sometimes leucopenia, monocytosis, or neutropenia. Toxic granules were only found in small quantities. The blood picture alone is not considered sufficient basis for diagnosis.

—JAC. JANSEN (UTRECHT).

CHARMOY, R. (1938). L'inspection du poumon tuberculeux chez les animaux d'espèce bovine. **[Examination of Lungs of Cattle for TB.]**—*Thesis, Alfort.* pp. 69. [Numerous refs.]

A description is given of routine abattoir inspection, and of the lesions of TB. in the lungs and associated organs. C. explains the methods by which the meat inspectors judge the carcass, in accordance with meat inspection regulations.

Details are given of the technique of collecting and examining bronchial mucus for presence of tubercle bacilli. It is concluded that no cases of pulmonary TB. in bovines can correctly be regarded as " closed " ; in all cases, tubercle bacilli may be excreted either constantly or intermittently in bronchial mucus.—H. B.

I. FELDMAN, W. H., & BAGGENSTOSS, A. H. (1938). **The Residual Infectivity of the Primary Complex of Tuberculosis.**—*Amer. J. Path.* **14.** 473-490. 1 text fig., 6 figs. on 2 plates. [18 refs.]

II. —. (1938). **Endogenous Reinfection and Primary Complex.**—*Amer. Rev. Tuberc.* **38.** 791-793. [3 refs.]

I. The literature on human TB. shows no unanimity of opinion on the duration of the infectivity of the tuberculous primary complex ; morphological evidence is not in itself a satisfactory criterion and should be supplemented by animal inoculation. An attempt was made to detect the presence of tubercle bacilli in such lesions by g. pig inoculation and cultural examination. Material was obtained at autopsy from 68 subjects dying from causes other than TB. In only one case were tubercle bacilli recovered—by both animal inoculation and cultural methods—and the organism was of the human type. The ages of the cases studied varied from 7 to 90 years.

The conclusion is drawn that encapsulated or sclerotic primary tuberculous foci seldom contain viable or virulent tubercle bacilli and that in the adult human being endogenous reinfection is improbable. The authors consider that histological evidence of activity in the primary tuberculous complex is not reliable evidence of infectivity and may possibly be due to silica, which is fairly constantly present in such foci.

II. In this short editorial, certain important criticisms are made of the previous article. " Primary complex " is a gross anatomical diagnosis and can be made only by examining the respiratory organs complete with their associated lymph nodes. There is considerable doubt as to whether many of the lesions examined by the authors of I. were primary tuberculous lesions ; confirmation of this criticism is afforded by the photomicrographs. Again, it is doubtful whether the pathogenesis of reinfection can be best studied in individuals in which reinfection has not occurred. The fact that all except one of the lesions examined proved sterile probably explains the freedom of these persons from evidence of reinfection : the evidence presented does not prove, or even suggest, the improbability of endogenous reinfection. It merely shows that tuberculous lesions in man can heal and become free from viable or virulent tubercle bacilli.—E. G. WHITE.

SEIDELIN, G. (1937). **Experimental Investigations on the Correlation between the Chloride Content of the Organism and the Tuberculous Infection.**—*Acta path. microbiol. scand.* **14.** 15-23. 2 tables. [4 refs.] [In English].

Six rabbits infected with bovine TB. and three controls were divided into three groups. One group received normal rabbit food (turnips and oats), another a diet low in NaCl, and the third a diet containing ample amounts of NaCl. There was a definite significant rise in the chloride values of both serum and whole blood in the two latter groups, and these animals showed a less pronounced TB. infection on P.M. examination than those which were fed the normal diet, and in which there was no change in blood chloride values. No hypochloraemia was noticed in those rabbits which had large pulmonary TB. infections, and analysis of the tissues for chloride revealed no signs of chloride retention or depletion in any of the organs.—ALFRED EDEN.

KON, S. K., & MADDOCK, C. (1938). **Experiments on the Effect of Vitamin A Deficiency on the Resistance of Pigs to Tuberculous Infection from Naturally Infected Milk.**—*Vet. Rec.* **50.** 1693-1697. 5 tables. [11 refs.]

Two lots each of four pigs from the same litter were fed on a vitamin A-deficient ration consisting of :– barley meal 50 %, wheatings 35 %, extracted soya bean meal 8 %, meat meal 5 %, salt 0·5 %, and ground limestone 1·5 %. Each pig of one lot, at nine weeks old, received 5 ml. of vitamin A concentrate daily, containing 600,000 Moore blue units. At this time one of the pigs was slaughtered and measurement of the vitamin A content of its liver showed that its reserves were low.

About three months later, when the pigs of the control lot showed clinical signs of vitamin A-deficiency, both lots received as a daily addition to the diet 400 ml. of separated milk from a cow affected with mammary TB. The milk was thoroughly mixed and care was taken that no heavier infection with tubercle bacilli was given than might be found under ordinary farm conditions. Administration continued for about five months, when an intradermal tuberculin test was carried out ; all gave reactions. The vitamin A-deficient pigs were in poor condition and moved with difficulty, and after a few days both lots were slaughtered. P.M. examination revealed equal and extensive tuberculous lesions in all pigs. Vitamin A estimations revealed that the liver stores of those on the deficient ration were completely exhausted.

It is concluded that the administration of vitamin A even in large doses does not increase the resistance of pigs to tuberculosis.—D. D. OGILVIE.

ROSA, A. (1937). Il bacillo tubercolare de tipo bovino nella tuberculosi pulmonare umana. [**Bovine Tubercle Bacillus in Human Pulmonary TB.**]—*Riv. Pat. Clin. Tuberc.* **11.** 237-242. [13 refs.]

Out of 147 cases of human pulmonary TB., mostly from around Bologna, the author found only one case of bovine type infection, by culture on Petragnani's medium and inoculation into rabbits.

I. NIKOLIĆ, N. (1938). Experimentelle Studien über die Variationen des B. tuberculosis auf neuen synthetischen Nährböden Z. 23, Z. 24, Z. 25, Z. 26, Z. 30, Z. 37. [**The Variations of** *Mycobacterium tuberculosis* **on New Synthetic Media**].—*Zbl. Bakt. I.* (*Orig.*). **141.** 66-72. 6 figs.

II. LOCKEMANN, G. (1938). Zur Frage der eiweissfreien Nährlösungen für Tuberkelbazillen. [**Protein-Free Culture Media for Tubercle Bacilli**].—*Ibid.* **142.** 79-82. 1 table. [4 refs.]

III. GRÓH, E. (1938). Ueber Versuche zur Trennung gemischter Tuberkel-

bazillenkulturen auf Nährböden von verschiedenem Alkälitatsgrad. [**Attempts to Separate Mixed Cultures of Tubercle Bacilli on Media of Different Alkalinity**].—*Ibid.*, 190-197. [3 refs.]

IV. Davy, P. E., & Levaditi, J. C. (1938). Rôle de la centrifugation dans la recherche du bacille de Koch par les procédés d'homogénéisation. [**Use of Centrifugation for the Demonstration of Tubercle Bacilli with the Aid of Homogeneization**].—*Ann. Inst. Pasteur.* **61.** 300-312. 2 figs. 7 tables. [7 refs.]

I. A description of variations in colony morphology of bovine and human types of tubercle bacilli, when growing on different types of synthetic medium. N. considers that such variations are of definite practical value in distinguishing the two types from one another.

II. A description of a synthetic protein-free medium valuable for the cultivation of tubercle bacilli. The constituents are :– sodium di-hydrogen phosphate (crystals), 0·3 % ; potassium di-hydrogen phosphate, 0·4 % ; magnesium sulphate (crystals), 0·25 % ; sodium citrate (crystals), 0·25 % ; ferri-ammonium sulphate (crystals), 0·001 % ; asparagine, 0·5 %, and glycerin, 2·5 %, all in distilled water. Sterilization is effected at 100°C. for one hour on three successive days, or at 105°C. for 30 minutes.

III. G. was unable to separate mixed cultures of bovine and human type of tubercle bacilli by cultivation on synthetic media of varying pH.

IV. The identification of tubercle bacilli in tuberculous sputum by microscopic or cultural examination, or by animal inoculation, is facilitated by the breaking up of clusters of organisms and their even distribution throughout the material to be examined. A technique for the homogenization of debris-containing sputum is described. After homogenization, concentration of the organisms is best effected by centrifugation at 3,000 r.p.m. for 30 minutes.—E. J. Pullinger.

Sartori, C., & Bonezzi, G. (1936). Sulla eliminazione per via renale dei bacilli tubercolari nei bovini vaccinati col B.C.G. [**Excretion of Tubercle Bacilli by Cattle Vaccinated with BCG**].—*Boll. Soc. med.-Chir. Pavia.* **50.** 145-163. 1 table. [Numerous refs.]

Ten rabbits were inoculated intravenously with 25 mg. of BCG each, and ten days later with 1 mg of virulent tubercle bacilli. The urinary meatus was closed, and every 24 hours the urine was removed with a cannula through the abdominal wall and tested by g. pig inoculation and cultivation on Löwenstein's medium, but no tubercle bacilli were found. The rabbits usually died very quickly. Another series of experiments on rabbits and a third series on four calves, using a catheter to remove the urine, also failed to reveal the presence of any bacilli in the urine.

Simonelli, A. (1936). Contributo allo studio della endocardite da bac. Pyogenes nei bovini. [**Endocarditis caused by *Corynebacterium pyogenes* in a Calf**]. —*Profilassi.* **9.** 92-96. 5 figs. [17 refs.]

S. describes a case of endocarditis in a calf at an abattoir ; there were also lesions in the liver, kidneys and spleen. From the macroscopic and microscopic examinations S. concludes that the causal organism was *Corynebact. pyogenes.* No cultures were grown.

I. Buchholz, G. (1937). Interferometrische Untersuchungen über die Wirkung von Rotlaufbazillen auf Rotlaufimmunserum. [**Interferometric Tests on the Action of *Erysipelothrix rhusiopathiae* on Homologous Antiserum**].—*Inaug. Diss., Berlin.* pp. 19. Numerous tables. [Numerous refs.]

II. BRAMM, G. A. (1937). Ueber die Virulenz der saprophytisch in den Tonsillen des Schweines vorkommenden Rotlaufbakterien. [**Virulence of** *E.r.* **Existing Saprophytically in the Tonsils of Swine**].—*Inaug. Diss., Berlin.* pp. 15. 4 tables. [Numerous refs.]

I. Using the interferometric method—an optical method for demonstrating changes resultant upon the lysing of bacteria in a suspension—on bacillus-antiserum mixtures, the author sought for the presence in swine erysipelas immune serum of a factor capable of destroying the bacilli. He found that in the normal serum of bovines, horses, swine, or rabbits there was no such bactericidal factor, but that antiserum from horses or rabbits lysed both the living and dead bacilli. The action was quite specific.

II. From the tonsils of all of 50 healthy swine examined, B isolated six strains of *E.r.* which were highly virulent to mice, and which could not be differentiated by their cultural or biochemical characters from *E.r.* pathogenic for pigs or from *Pasteurella muriseptica.*

RADVILA, P. (1936). Zur aktiven Immunisierung gegen Schweinerotlauf mit virulenten Rotlaufglukosidkulturen. [**Immunization against Swine Erysipelas with Glucoside Cultures**].—*Wien. tierärztl. Mschr.* **24.** 603-604.

R. experimented on the use of glucosides, added to S.E. cultures, as means of immunizing rabbits, pigeons and swine against S.E. The vaccines prepared were not good.

DE MOULIN, F. (1938). Onderzoek naar den aard der immuniteit tegen haemorrhagische septichaemie. [**The Nature of Immunity against Haemorrhagic Septicaemia**].—*Ned.-ind. Bl. Diergeneesk.* **50.** 212-237. 3 figs.

After a virulent strain of *Pasteurella boviseptica* had been injected subcutaneously into rabbits, buffaloes and goats, histological examination revealed that the bacilli were not phagocytosed by the leucocytes, but were destroyed by endothelial and epithelioid cells. This occurred in unimmunized as well as in immunized animals. Injection of bacilli alone gave hardly any immunity, but injection of a heat-killed broth culture was effective. A culture filtrate also produced an effective immunity. The best immunity was obtained with centrifuged formolized broth cultures. M. concludes that the character of the immunity is not antibacterial but anti-aggressive.—JAC. JANSEN (UTRECHT).

KESSENS, B. H. (1936). Vergelijkend onderzoek betreffende *Haemophilus coryzae, Haemophilus influenzae* en andere haemophiele bacillen. [**Comparison between** *H.c.* **and** *H.i.*]—*Thesis, Utrecht.* pp. xi+124. 4 figs. on 2 plates, numerous tables. [Numerous refs.]

There is some morphological difference between *H.c.* of fowls and *H.i.* The latter are a little thicker, while colonies of *H.c.* are always smaller than those of *H.i.*; the largest colonies are obtained on " chocolate agar ". *H.c.* does not survive for more than two weeks in culture tubes, while *H.i.* survives for four weeks. The best solid culture medium is 200 c.c. of sterilized agar to which 100 c.c. of sterile blood are added, the whole being heated at 65°C. for ten minutes. The best liquid medium is 10% blood broth containing a piece of raw potato. The most satisfactory pH is 7·4.

H.c. requires the V factor, but not the X factor. A thermolabile factor, called C, is believed to be necessary. This C factor occurs in blood-cells, in some sera, and in potato. Only a slight relationship in the antigenic structure of the two species was found. *H.c.* could only be cultivated from cases of coryza with

a short incubation period. These cultures produced coryza in fowls after an incubation period of 1-2 days.—JAC. JANSEN (UTRECHT).

NORDLUND, Ingrid. (1938). Några undersökningar angående råttor som smittospridare vid vissa djurparatyfoser. **[Rats as Spreaders of Animal Paratyphoid Bacteria].**—*Svensk VetTidskr.* **43.** 172-180. [17 refs.]

During recent years outbreaks of salmonella infection in farm animals have been frequently recorded in Sweden. In some of them evidence has incriminated rats as either the source or the transmitters of the infection. Four such cases are here reported.

Sixteen lambs of a flock numbering 68 died suddenly after having been fed on wheat which was heavily contaminated with rat droppings. Two lamb carcasses were examined P.M. and the cause of death was found to be *S. enteritidis* var. *dublin*. The same type of organism was shown to be present in the grain, and also in the alimentary canal of two rats which were caught on the premises.

In two herds scours in calves was found to be due to *S.e.* var. *dublin* infections. In five of ten rats captured on the one farm and in one rat captured on the other the homologous type of salmonella organisms was demonstrated.

Similar observations were made in an outbreak of *S. typhi-murium* infection in the laboratory stock of g. pigs.

Finally data are given which show that rats experimentally infected with *S.t.-m.* may transmit the infection to healthy g. pigs if the latter are housed in cages where the rats have been kept, or if their bedding is contaminated with intestinal contents from rats so infected.—GUSTAV NAERLAND (OSLO).

MARCATO, A. (1936). Colibacillosi con manifestazioni di corizza nei polli della colonia Eritrea. **[Fowl Coryza in Eritrea].**—*Nuova Vet.* **14.** 235-243, and 272-275. 8 figs., 1 table.

Three fowls of the flock at the Serum and Vaccine Institute in Eritrea were found to be affected with coryza. They all died, but there were no further cases. Microscopic examination of smears of nasal exudate showed a large number of Gram-negative coliform bacteria. In cultures from material from the eyes and hearts of the birds on ordinary media coliform organisms were obtained.

After experiments on the infection of fowls with tissue material taken directly from the three original birds, other fowls were inoculated in various ways with cultures from this material. In most cases conjunctivitis with ocular and nasal secretions followed and also some loss in weight, but there were no deaths. In most cases *Bact. coli* was cultivated from the heart.

M. concludes that there exists in Eritrea an infectious disease of fowls with clinical and pathological symptoms similar to those of infectious coryza and which is caused by an organism of the *coli-aerogenes* group. It causes a generalized infection, of which the coryza is one manifestation.

CARROL, A. N. (1938). **The Practitioner's Summary of Current Opinion on Bang's Disease.**—*J. Amer. vet. med. Ass.* **93.** 244-248.

In C's opinion, a survey of the methods of control of Bang's disease would seem to show that an effective and practical policy must embrace both blood-testing and vaccination, that blood-testing and elimination of reactors are an excellent beginning, but that calf vaccination and immunization are worthy of a place in a control plan.

In Virginia the percentage of reactors dropped from 9·7% to 1·5% in two

years as a result of the work undertaken. Vaccination of calves and heifers has given good results, but its value in the case of mature animals is doubtful.

—D. D. OGILVIE.

CHAMBERS, F. (1938). **Clinical Manifestations of Brucellosis Associated with Farm Stock.**—*Vet. Rec.* **50.** 1106-1110. [9 refs.]

A general discussion ; there is no new material.—BRENNAN DEVINE.

I. LÜHRS, E. (1938). Einfluss saurer und alkalischer Nahrung auf die Abortus Bang-Infektion und auf Agglutininbildung. [**The Influence of Acid and Alkaline Diets on *Brucella abortus* Infection and on Agglutinin Formation**]. —*Z. InfektKr. Haustiere.* **53.** 43-48. 6 tables, 1 graph.

II. SANDHOLM, A. (1938). Ist die Ratte an der Verbreitung des ansteckenden Verwerfens mitbeteiligt ? [**Role of Rats in the Spread of Bovine Brucellosis**]. —*Ibid.* 201-210. 5 tables. [9 refs.]

III. MARIENBURG, H. (1938). Ueber die Folgen der Rinder-Bruzellose und deren Bekämpfung. [**Effect of Bovine Brucellosis and Its Control**].—*Dtsch. tierärztl. Wschr.* **46.** 228-232. 2 figs., 3 tables. [Numerous refs.]

IV. BISCHOFF, O. (1938). Ueber gehäuftes Auftreten von akuten Gelenkerkrankungen beim Rinde, verursacht durch Brucella abortus (Bang.) [**An Outbreak of Arthritis Associated with *Br.a.* in Cattle**].—*Ibid.* 260-262. 2 figs., 1 table. [8 refs.]

V. KARSTEN, & EHRLICH. (1938). Ist die Tilgung der Rinder-Brucellose erreichbar ? [**The Possibility of Eradicating Bovine Brucellosis**].—*Berl. tierärztl. Wschr.* May 13th. 274-277. 3 tables.

I. The author investigated the problem as to whether acid foodstuff (silage and certain concentrates) has an influence on the incidence of bovine brucellosis, and whether the disease is more rife in cattle on an acid diet than in those on a non-acid diet (natural pasture). He made observations on 1,000 cows for one year and found no evidence for the above supposition.

He also infected rabbits with *Br.a.* after putting them on acid and alkaline diets, but the diets had no influence on the infection as evidenced by the agglutinin response.

II. S. concludes that rats are very resistant to oral infection with *Br.a.*, but noted that after being fed this organism they excreted viable organisms in the faeces for a week or more, thus acting as mechanical carriers of infection.

III. An article to stress the heavy economic loss which accompanies *Br.a.* infection. It is shown that the trouble is not confined to the loss of a calf, but that milk is lost over several seasons. Experimental data are recorded in support of this statement.

IV. A clinical report of *Br.a.* infection in cattle associated with joint swellings. Out of 26 animals, 25 proved infected, and of these, five showed joint lesions. It was possible to isolate *Br.a.* from fluid extracted from the swollen joint of one animal.

V. The seriousness of contagious abortion is stressed. The disease can be combated and eliminated by following the usual precautions, but it is noted that there are occasional animals which carry and even excrete *Br. abortus*, but which do not give positive serological reactions. Such animals are a serious menace to the successful eradication of infection.—E. J. PULLINGER.

MCEWEN, A. D., & PRIESTLEY, F. W. (1938). **Experiments on Contagious Abortion. Immunisation Studies with Vaccines of Graded Virulence.**—*Vet. Rec.* **50.** 1097-1106. 9 tables. [7 refs.]

The authors describe vaccination tests with an avirulent strain " strain 45 " of *Brucella abortus* on g. pigs which confirm their previous investigations [*V. B.* **7.** 61.], *i.e.*, that the resistance of g. pigs to *Br.a.* could be increased by vaccination.

In two series of experiments female g. pigs were used and after they had been vaccinated, were allowed to breed. The animals were infected 74 days after vaccination, some subcutaneously and others by infection in the eye. The eye infection proved a more severe test than the subcutaneous inoculation. It was found that the variant showing the highest degree of virulence conferred the highest degree of protection.

The results further showed that resistance to *Br.a.* could be greatly increased by successive vaccinations with strains of gradually increasing virulence. The authors suggest that a similar method of immunization might be effectively adopted for cattle.—BRENNAN DEVINE.

STONE, W. S. (1938). **Brucellosis in Horses.**—*Cornell Vet.* **28.** 91-98. 2 tables. [19 refs.]

The blood of 1,172 city horses, 205 country horses, and 135 hospital horses was subjected to the agglutination test for *Br. abortus*. In general, in the group examined, the incidence of agglutinins was low in healthy city horses, somewhat higher in healthy country horses, and highest in clinically affected horses (surgical diseases). Reactions at 1:50 or higher occurred in 9·6%, 23·9%, and 42·5% respectively. Agglutinins appear in clinically normal horses, and the titre is no indicator of either active or latent infection. It is suggested that there is a higher incidence of brucellosis in horses which make intimate contact with cattle and that, conversely, Bang's disease can be transmitted to cattle from horses.—D. D. OGILVIE.

ARIEL, M. (1937). K patologiceskoj morfologii brucelleznogo aborta ovec. [**On the Morbid Anatomy of Abortion of Sheep Caused by** *Brucella melitensis*]. —*Brucellosis in Sheep.* pp. 129-149. 10 figs., 2 tables. [Numerous refs.] Moscow : Viem Publ. Dept.

The changes in the uterus of the sheep after abortion due to *Br.m.* are characterized by necrosis of the placenta and the subsequent repair of the necrotic areas by granulation tissue. Inflammation as a result of the infection apparently begins in the placenta during gestation, interfering with its normal development. Hyaline degeneration of the walls of the crypts and penetration of the necrotic areas by connective tissue prevent detachment of the placenta after abortion, and foci of infection develop in the uterine mucous membrane. Macrophages and giant cells of syncytium and Langhan's types collect, and the lesion is surrounded by a fibrous capsule.

Changes are also observed in the udder, lymph nodes, liver, spleen, adrenal glands and kidneys, the more important occurring in the liver and lymph nodes. In the liver, foci of hypertrophied Kupfer cells fill up the capillaries, and eosinophile leucocytes and giant cells are sometimes present. Necrosis of the centre of these foci is also well marked.

The focal character of the lesions appears most clearly in the liver and the uterine mucous membrane. In the lymph nodes the most conspicuous lesions are diffuse hyperplasia of the reticulo-endothelial cells ; focal lesions, not of a necrotic character, occur in the cortex.

ARIEL, M. (1937). K patologičeskoĭ morfologii patentnogo brucelleza ovec. [**On the Pathological Morphology of Latent Sheep Brucellosis**].—*Brucellosis in Sheep.* pp. 157-176. 8 figs., 4 tables. [Numerous refs.] Moscow: Viem Publ. Dept.

In 1933, A. carried out autopsies on 24 ewes and seven rams which had given positive reactions to the agglutination test for brucella infection. He found that in infected sheep, there was a series of pathological changes in the lymph nodes, liver, udder and uterus.

The changes were most marked in the lymph nodes. There was a thinning of the cortical layer and an impoverishment in lymphocytes: the pith strands contained plasma cells. Large numbers of polynuclear cells were present, and there was hyperplasia of the reticulo-endothelial cells which often resulted in the formation of granulomatous nodules.

Granulomatous nodules were also found in the mucous membrane of the uterus of ewes that had not aborted; they were composed of epithelioid and giant cells, unlike nodules that occur in the mucous membrane after abortion, the latter being composed of large polynuclear cells with leucocytic infiltration and necrosis at the centre. There was diffuse hyperplasia of Kupfer's cells of the liver, but nodules were rarely found in this organ. The spleen sometimes showed reactive centres with cells in the process of mitosis; this reaction also occurred in the cortical layer of the lymph nodes. The udder and kidneys were fairly constantly affected, and the inflammatory lesions of the interstitial tissue of these organs explain the excretion of brucella organisms in the urine and milk of affected animals over long periods.

It was not decided whether certain suppurative lesions that were encountered were due to brucella or not.

I. DALRYMPLE-CHAMPNEYS, W. (1938). **Undulant Fever.**—*Lancet.* **325.** 326-328. [10 refs.]

II. JOÓS, Ilona. (1938). Ueber Banginfektionen bei Menschen. [*Brucella abortus* **Infection in Man**].—*Zbl. Bakt. I.* (*Orig.*). **141.** 149-153. [Numerous refs.]

III. HIROKI, H. (1938). Epidemiologische Beobachtungen bei der Brucellosis des Menschen in Japan und in Mandschukuo. [**Human Brucella Infection in Japan and Manchukuo**].—*Z. ImmunForsch.* **92.** 382-391. 2 tables. [16 refs.]

I. A brief review of the subject of U.F. to show that such a disease does exist in England and Wales and is sufficiently serious to warrant careful consideration. Those interested are referred to the original, but the following points are of general interest:–

(a). It is considered that WILSON's estimate [(1932). *Vet. Rec.* **12.** 1226.], that 400-500 cases of U.F. occur annually in Great Britain, is not an exaggeration of the true position.

(b). Diagnosis in man depends primarily upon the agglutination test, and since " prozones " occur, a long series of serum dilutions should always be put up. [" Prozone " is the term applied when the tubes containing low serum dilutions in a serological test give negative readings while tubes containing higher dilutions show positive reactions]. Whilst a positive agglutination reaction is conclusive, a negative reaction early in the illness does not rule out the presence of U.F. Whenever possible, blood culture should be carried out, as in this way cases may be discovered early when the bacteraemia is in progress. Where clinical evidence favours the existence of U.F., but the aggl. test is negative, a brucellin skin test should also be made.

(c). The source of infection is nearly always direct contact with infected live animals, contaminated litter or excreta, or by the consumption of contaminated raw milk. To explain why so few cases of U.F. occur, when so much contaminated raw milk is drunk, the work of GARROD [*V. B.* **8.** 763.] is quoted. G. found that *Br. abortus* is highly susceptible to the action of the acid gastric juices, and he suggests that *Br.a.* can only pass through the stomach alive if the consumer is for any reason suffering from gastric hypo-acidity.

II. Of 16,301 samples of human serum collected in Budapest for typhoid tests, 21 samples gave positive reactions when tested for *Br.a.*, indicating that the persons from whom these samples were collected were affected with U.F. A further 7·9% of the total number of samples gave slight positive aggl. reactions with this organism, indicating the probability that these were latent or waning cases of infection.

III. Such figures as are available are quoted. These tend to indicate that, in Japan and Manchukuo, contagious abortion of cattle and *Br.a.* infection in man are about as prevalent as in Europe and America. *Br. melitensis* infection has not been encountered in the Orient.—E. J. PULLINGER.

GIULIANI, V. (1936). Ricerche sulla differenziazione delle " Brucelle melitensis, abortus bovis ed abortus suis " mediante la cultura in terreno di Petragnani. [**Differentiation of Brucella on Petragnani's Culture Medium**].—*Nuova Vet.* **14.** 205-209.

Using 145 strains of brucella, comprising 81 strains of *Br.m.*, 51 strains of *Br.a.* and 7 of *Br.s.*, the author tested the de Santis method for differentiation on Petragnani's egg medium [*V. B.* **4.** 503, **5.** 797, **6.** 499, and **7.** 11]. He concludes that it is the best method of differentiation of *Br.m.* and *Br.a.* and that by cultivation on media with and without malachite green *Br.s.* can also be differentiated.

ZORZOLI, G. B. (1936). Differenziazione delle Brucelle. Studio sul ricambio del zolfo e sul diverso comportamento delle Brucelle in terreno di Petragnani e Loewenstein. [**Cultural Differentiation of Brucella**].—*Nuovo Ercol.* **41.** 354-371. 6 tables. [Numerous refs.]

After experiments on 50 strains of *Br. abortus*, *Br. melitensis* and *Br. paramelitensis* from various sources, Z. states that the production of H_2S is a reliable guide for the differentiation of brucella strains. Cultivation on Petragnani's medium and on Löwenstein's media is a simple method for differentiating *Br.a.* and *Br.m.* *Br.m.* and *Br. paramelitensis* grow more rapidly in Löwenstein's medium with congo red added than on the other media.

CASANOVA, F., & PELOSO, M. T. (1936). Ricerche sui caratteri culturali di vari stipiti di Brucella. [**The Cultural Characters of Various Strains of Brucella**]. —*G. Batt. Immun.* **16.** 361-372. 1 fig., 1 table. [15 refs.] [English, French and German summaries].

The authors observed the cultural characters of 66 strains from various sources, of *Br. abortus*, *Br. para-abortus*, *Br. melitensis* and *Br. paramelitensis*, grown on the egg media of Petragnani, Bruschettini, and Löwenstein and on plain agar and liver agar, with and without thionin. The results are given in a table. They conclude that the property of producing H_2S is the best method of differentiation between human and bovine strains [presumably means between *abortus* and *melitensis*] and that Huddleson's thionin method is the best of those based on bacteriostasis, but that the thionin must be chemically pure and not exposed to light or air for a long period. Cultivation on egg media is less reliable, but the inhibition of the growth of *abortus* is greatest on Petragnani's medium.

KLIMMER, M. (1938). Zur selektiven Züchtung der Abortus-Bang-Bakterien aus einem an Begleitbakterien reichen Material (Milch). [**The Selective Cultivation of *Brucella abortus* from Milk**].—*Arch. wiss. prakt. Tierheilk.* **73.** 325-359. 18 tables. [Numerous refs.]

K. discusses the dispersion of brucella organisms in the constituent parts of milk. While gravity cream is the most suitable single fraction to use for this demonstration, it contains only about a quarter of the organisms present in the whole milk. A mixture of gravity cream and sediment, emulsified in whole milk, is the best source of material for such study. Concentration by agglutination is useless, possibly owing to the slow rate of agglutination.

After studying the value of a large number of selective agents for use in cultural work, K. concluded that malachite green, gentian violet, victoria blue and zephirol are the most useful. The use of the first two is well known. Victoria blue should be used in a concentration of 1:20,000 and zephirol in a concentration of 1:10,000. Victoria blue has one advantage over zephirol in that it slightly colours brucella colonies, thus distinguishing them from fat droplets.—E. J. PULLINGER.

SARNOWIEC, W. (1938). Sur l'apparition des formes filtrables de *Brucella abortus* (*Brucella bovis*) dans des milieux additionnés de tuberculine. [**Appearance of Filtrable Forms of *Br. abortus* on Media Containing Tuberculin**].—*C. R. Soc. Biol. Paris.* **129.** 129-132. [3 refs.]

Filtrates through Chamberland L2, L3 and L5 candles of cultures of a bovine strain of *Br.a.*, grown on ordinary media containing tuberculin, were injected subcutaneously and intraperitoneally into groups of three g. pigs each, and produced agglutinating titres of 1:300 to 1:400 for *Br.a.*, as well as lesions typical of *Br.a.* infection. Filtrates from cultures grown in the absence of tuberculin provoked agglutinins in a titre of 1:30, with very slight evidence of infection. Stained tissue smears obtained from typical lesions that developed after injection of the filtrates showed no visible bacteria, and sub-culture was unsuccessful.—R. O. MUIR.

SIEVERT, Lena. (1936). Untersuchungen über den Antigenaufbau in der Brucellagruppe. [**Brucella Antigens**].—*Z. ImmunForsch.* **89.** 249-259.

S. studied the antigenic structure of the brucella group and reached the same conclusions as WILSON and MILES [*V. B.* **2.** 488], namely that *Br. melitensis* and *Br. abortus* have two common antigens, but that *Br.m.* antigen predominates in *Br.m.* strains, and *Br.a.* antigen in *Br.a.* strains.

The work of S. differs from that of other workers in that she was able to absorb all antibodies from *Br.m.* antiserum with *Br.a.* antigen, whereas she could not absorb all antibodies from *Br.a.* antiserum with *Br.m.* antigen. This suggests that *Br.a.* (and *Br. suis*, which behaved similarly) contain not only all the *Br.m.* antigens but an extra one as well. [This work should be repeated with freshly isolated smooth strains of brucella, and if then confirmed it will be of considerable diagnostic importance].—E. J. PULLINGER.

MASHETER, J. W. H. (1938). **Entero-Toxaemia of Sheep.**—*Vet. J.* **94.** 430-431.

M. records the occurrence of enterotoxaemia in three flocks of sheep which were folded on arable land. The mortality varied from 9·6% to 23·3%. From intestinal material a toxin was demonstrated which was neutralized only by *Clostridium welchii* Type D antitoxin.—R. FISHER.

ROSSI, P. (1939). L'ureé sanguine dans les entéro-toxémies et les complications gangréneuses des traumatismes du cheval. [**Blood Urea in Enterotoxaemia**

and Gangrenous Conditions in the Horse].—*C. R. Soc. Biol. Paris.* **130.** 614-615. [1 ref.]

Blood tests were carried out on ten horses affected with certain icteric conditions, which R. infers were associated with enterotoxaemia or wound gangrene due to organisms of the gas gangrene group, principally *Clostridium septique*. There was a considerable elevation of blood urea, the level rising from the normal 0·40-0·45 g. to as high as 1·95 g. Parallel with this there was a slight fall in serum chlorides.—N. J. SCORGIE.

COBURN, D. R., & QUORTRUP, E. R. (1938). **Atypical Botulism in Turkeys.**—*J. Amer. vet. med. Ass.* **93.** 385-387. 2 figs.

An outbreak of botulism in a flock of turkeys which had access to stagnant water is recorded. Affected birds showed posterior paralysis, dyspnoea, slight cyanosis, and occasionally conjunctivitis, but the pathognomic sign of paralysis of the membrana nictitans was absent. The only P.M. lesions were petechiae of the auricular epicardium and hyperaemia of the duodenal mucosa. Diagnosis was confirmed by the toxic action of filtered water samples upon mice and the isolation of *Clostridium botulinum* (Type C) from near-by soil. *Cl.b.* antitoxin Type C was used successfully in treatment, and the outbreak ceased when the flock was moved to new land.—D. D. OGILVIE.

KLIGLER, I. J., GUGGENHEIM, K., & WARBURG, F. M. (1938). **Influence of Ascorbic Acid on the Growth and Toxin Production of *Cl. tetani* and on the Detoxication of Tetanus Toxin.**—*J. Path. Bact.* **46.** 619-629. 6 figs., 5 tables. [6 refs.]

The addition of ascorbic acid to a peptone meat extract broth enables *Cl. tetani* to be grown aerobically. The amount required varies with the concentration of peptone, but in any case the minimum is 0·5 parts per thousand. The presence of the vitamin in the medium inhibits the production of, or detoxicates, toxin, and the resulting cultures are only 1/4 to 1/10 as toxic as controls. The detoxicating effect of the vitamin is also shown on toxin solutions and is thought to be due to concentration of the vitamin and toxin followed by the oxidation of the resultant mixture.—P. S. WATTS.

I. SOUTO, A. B., & LIMA, C. (1938). Action de la vitamine C sur la toxine du vibrion-septique. [**Action of Vitamin C on the Toxin of *Clostridium septique***].—*C. R. Soc. Biol. Paris.* **129.** 79-82. 3 tables.

II. SOUTO, A. B., & LIMA, C. (1938). Action de la vitamine C sur la toxine du Bacillus oedematiens. [**Action of Vitamin C on the Toxin of *Cl. oedematiens***].—*Ibid.* 763-766. 3 tables. [3 refs.]

III. SOUTO, A. B., & LIMA, C. (1938). Action de la vitamine C sur la toxine du Bacillus histolyticus. [**Action of Vitamin C on the Toxin of *Cl. histolyticus***].—*Ibid.* 767-769. 3 tables.

I. Three intramuscular injections of vitamin C (ascorbic acid) gave 61 mice a considerable resistance to an intravenous injection of the toxin of *Cl.s.* A single dose of the vitamin injected into 30 mice 1-5 hours after 1-2 M.L.D. of toxin produced irregular antitoxic action, while repeated doses injected after one- and three-hour intervals protected five mice against 1 M.L.D. of toxin, but not against 2 M.L.D. Intravenous injection of vitamin-toxin mixtures into 30 mice demonstrated that neutralization obeyed the law of multiple proportions and increased in degree with the contact period.

II. Vitamin C increased the resistance of 46 mice to the toxin of *Cl.o.* and

a single dose injected up to two hours after the toxin produced a feeble antitoxic action in 28 mice and none at all in 14 mice injected five hours after the toxin. Repeated doses of vitamin at one- and three-hour intervals after injection with 1 M.L.D. of toxin protected seven out of eight mice, but against 2 M.L.D. they were inactive in eight other mice. The neutralizing power of vitamin C was well demonstrated in 60 mice injected with vitamin-toxin mixtures, and increased with prolonged contact.

III. Vitamin C had an apparent prophylactic effect upon 30 mice against the injection of 1-2 M.L.D. of the toxin of *Cl.h.* In ten mice its antitoxic action against 1-2 M.L.D. of toxin lasted up to one hour after injection of toxin and disappeared after two hours. Repeated doses of vitamin at one- and three-hour intervals after injection of 1-2 M.L.D. of toxin gave no protection in ten mice. Marked neutralization of the toxin in mixtures with vitamin was illustrated in 40 mice, but did not obey the law of multiple proportions and did not increase with prolonged contact.—R. O. MUIR.

BAKOS, M. (1934). Vizsgálatok a bakteriumok elfajulásának okairól. [**Investigations on the Causes of Degeneration of Bacteria**].—*Közl. Oesszehas. élét- és kórtan Köréből.* **26.** 249-262. 8 figs., 5 tables. [Numerous refs.]

Different forms of degeneration of the bacteria were often observed in cultures of *Salmonella cholerae-suis*, *Pasteurella aviseptica*, *Bacillus anthracis*, *B. pseudo-anthracis*, and *Erysipelothrix rhusiopathiae* on agar plates containing 2·5% lithium chloride with or without 4% sodium chloride. This was considered to be affected by the hypertonicity or hypotonicity of the culture medium, by the toxic action of the combined chemicals, and also by the liberated products of the decomposition of the dead bacteria. Nothing could be demonstrated in the cultures to indicate that the changes were due to any other cause.—G. SÀLYI (BUDAPEST).

I. RAO, M. A. N. (1938). **Rhinosporidiosis in Bovines in the Madras Presidency, with a Discussion on the Probable Modes of Infection.**—*Indian J. vet. Sci.* **8.** 187-198. 14 figs. on 4 plates. [14 refs.]

II. SAHAI, L. (1938). **Rhinosporidiosis in Equines.**—*Ibid.* 221-223. 5 figs. on 2 plates. [5 refs.]

I. Four previous reports of the occurrence of rhinosporidiosis in animals are quoted, and record is made of the finding of the disease in 18 bovines and one pony in Madras Presidency, during a period of six years, in districts where the disease is fairly frequently observed in man.

In all cases lesions were confined to the lower third of the nasal septum, and developed in connexion with some previous trauma. In about 50% of cases, lesions of nasal schistosomiasis were also present.

The clinical features and histology of the lesions are described, accompanied by some excellent photomicrographs of sections of the rhinosporidial tumour and of spores in nasal discharge. The causal parasite appears to be identical with that found in man. R. discusses the nature of the fungus and the probability of a saprophytic existence, and describes the method of cultivating it artificially.

All attempts to produce the disease by direct transmission of spores from a diseased to a healthy animal failed, and it is suggested that natural infection is probably brought about by dust-borne spores from a saprophytic phase in the life-history of the fungus.

II. Previous reports of rhinosporidiosis in animals are quoted, and the article records a case of the disease in a pony in Orissa Province, where the disease would appear to be rare. A description of the lesion is given.—F. J. ANDREWS.

DISEASES CAUSED BY PROTOZOAN PARASITES

ARGUN, T., & OEKTEM, Z. (1937). Memleketimiz hayvanlarmda surra. [**Surra in Turkey**].—*Askeri tibbi baytarî mecmuasi.* **131.** 369-380. 2 figs. [6 refs.] [French summary]. [Abst. from abst. in *Tierärztl. Rdsch.* **43.** 700].

This disease occurred in camels in Palestine in 1915, and later in Irak and Syria, with a high mortality. In 1923, after the Turkish War of Independence, it was diagnosed in some camels and Indian buffaloes in Ankara during rinderpest investigations.

RECEVEUR, A. E. F. (1938). Notes sur certaines affections du cheptel des régions nord-est du Tchad. [**Camel Trypanosomiasis in the Area North-East of Lake Chad**].—*Rec. Méd. vét. exot.* **11.** 113-118.

In investigating disease of stock in this area, R. encountered a disease of camels which he ascribes to infection with a trypanosome of the *Tryp. evansi* group. The disease, which is called " dioufar " by the natives, is characterized by progressive emaciation without loss of appetite, while P.M. there is emaciation without other pathognomic lesions. It is estimated that about 10 % of the camel population is affected, and the annual mortality is about 3 %, affected animals living about three years. Detection of the disease was found to be very difficult, the appearance of trypanosomes in the peripheral blood being irregular, and the sublimate test unreliable.

Treatment with naganol in doses of 5-7 g., given intravenously, was always ineffective as a cure ; temporary improvement might result, but finally the animals relapsed and died. It is thought that infection is transmitted by tabanids or *Stomxys*.—U. F. RICHARDSON.

PACKCHANIAN, A. (1938). **Susceptibility and Resistance of Various Species of Peromyscus (American Deer Mice) to Infection with Trypanosoma Hippicum and the Possibility of Certain " Wild Mice " being Reservoir Hosts to Pathogenic Trypanosomes.**—*Amer. J. trop. Med.* **18.** 587-593. [17 refs.]

It was found that some species of deer mice might survive infection with *Tryp. hippicum* [*Tryp. evansi* of the Panama Canal area] for as long as 250 days. A similar observation had already been made in respect of infection with *Tryp. brucei* [see *V. B.* **4.** 759]. It is suggested that mice may act as reservoir hosts of *Tryp. hippicum* and also of *Tryp. brucei*, and possibly other pathogenic trypanosomes, but no other evidence is produced in support of the suggestion.—U. F. R.

VLACH, G. (1936). La leishmaniosi canina in Trieste e provincia. [**Canine Leishmaniasis in Trieste**].—*Arch. ital. Sci. med. colon.* **17.** 513-541. 12 tables.

V. examined 115 dogs of different breeds—presumably taken at random—in Trieste and the surrounding province for various infections, and found that nine were infected with leishmaniasis. The spleen was somewhat enlarged in 8 of the dogs and normal in one. Details are given of the results of the examination of each dog. None of the dogs was affected with skin lesions.

MERTENS, W. K. (1938). Over het voorkomen van Leptospira icterohaemorrhagiae bij katten. [*L.i.* **Infection in Cats**].—*Ned.-ind. Bl. Diergeneesk.* **50.** 78-79.

A note drawing attention to the work of ESSEVELD and COLLIER [see next abstract].—JAC. JANSEN (UTRECHT).

I. Esseveld, H., & Collier, W. A. (1938). Leptospirose bei Katzen auf Java. [**Leptospirosis of Cats in Java**].—*Z. ImmunForsch.* **93.** 512-528. 6 tables. [Numerous refs.]

II. Esseveld, H., & Collier, W. A. (1938). Leptospirosis bij katten to Batavia. [**Leptospirosis in Cats in Batavia**].—*Eijkman Instituut, Batavia, 1888-1938.* p. 250. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*) **131.** 313].

I. The authors examined the serum of 500 cats in Java for agglutinins for *L. bataviae*, *L. javanica* and a few other strains, and prepared cultures from the kidneys of these animals on Noguchi's medium. Fourteen pure cultures of a leptospira were obtained, all coming from 343 large cats over 1·5 kg. in weight. Eighty of 310 large cat sera were positive in the aggl. tests, and gave rise to high titres against the two Dutch East Indian species of leptospira. The 14 cultures were typed serologically : eight proved to be *L.b.* and six *L.j.*

All the small young cats examined were found to be free of infection, but the results suggest that nearly one-third of all full-grown cats in Java are infected.

II. Five strains of leptospira were isolated from the kidneys of 96 adult cats in Batavia. All strains proved to be identical with the human and rat Batavia type, this showing that cats are concerned only to a small extent in the epidemiology of human leptospirosis. From the results of aggl. and lysis tests with the serum of 190 cats the authors are led to believe that over one-quarter of all adult cats in Batavia are carriers of infection.—J. E.

Pratt, I. (1937). **Excystation of the Coccidia,** *Eimeria tenella.*—*J. Parasit.* **23.** 426-427.

P. describes methods and attempts to induce excystation of the oocysts of *E.t.* *In vivo* experiments were conducted to determine the positions in the alimentary canal at which excystation occurred. An interesting and original observation concerned the excystation of oocysts in chicken's crops. This was observed among eight birds on three different occasions, and in some cases excystation occurred within five minutes. *In vitro* experiments carried out with sporulated oocysts treated with extracts of crop, proventriculus, duodenum, and pancreas, in addition to commercial pancreatin, were not successful. [The failures to produce excystation *in vitro* far outnumbered the successes].

In contrast to the view that the sporozoites are liberated from the spore within the oocyst and leave the cyst by the micropylar end, P. concludes that the spore is freed from the oocyst before the sporozoites break from the spore. [Some observations recently carried out in Great Britain would appear to support this conclusion].—C. Horton Smith.

Levine, P. P. (1938). *Eimeria hagani* **N.sp. (Protozoa : Eimeriidae). A New Coccidium of the Chicken.**—*Cornell Vet.* **28.** 263-266. [4 refs.]

A new coccidian species from the duodenum and intestine of the chicken is described and has been named *Eimeria hagani.* A mixture of this species and *E.maxima* was originally obtained from scrapings of the intestine, and pure cultures of the new species were obtained by feeding single oocysts to coccidia-free birds. The oocysts are described as broadly oval, with protoplasmic contents which almost fill the oocyst shell. In 1·5% potassium bichromate, sporulation occurred in 24-48 hours at 30°C. The sporulated oocysts measure $19{\cdot}1\mu \times 17{\cdot}6\mu$. As the entire life-cycle of this species is confined to the duodenum and small intestine, it can easily be differentiated from *E. tenella* and *E. necatrix.* The first occurrence of oocysts in the faeces is, like that of *E.maxima*, more than six days after infective feeding, but as the morphology of the oocysts is widely different it is a simple

matter to distinguish them. Experiments with birds immunized against the previously known species showed that the birds could be successfully infected with the new species, while, conversely, birds immunized against *E. hagani* were infected with the others. Haemorrhagic spots occur in the wall of the duodenum and intestine of most infected chickens, while in severe infections there is catarrhal enteritis, and the formation of mucous casts.—C. HORTON SMITH.

ELLIS, C. C. (1938). **Studies of the Viability of the Oocysts of** *Eimeria tenella*, **with Particular Reference to Conditions of Incubation.**—*Cornell Vet.* **28.** 267-274. 3 tables. [13 refs.]

This investigation was undertaken with a view to proving or disproving the speculation that oocysts, carried on the egg-shell during incubation, might remain viable and infect the newly hatched birds. Several interesting facts emerged; *e.g.*, sporulated oocysts on egg-shells remained viable for 28 days at a temperature of 9·8°C., for 8 days at 19°C., and for 7 days at 24°C. When the relative humidity remained constant, death of the oocysts was hastened by increase of temperature, and at a constant temperature decrease in the relative humidity also hastened the death of the oocysts. Of considerable practical interest is the fact that sporulated oocysts became non-viable after one day of exposure in an electric incubator at a temperature of 39°C., and at a relative humidity of 47%. When fertile eggs were contaminated with sporulated and unsporulated oocysts they hatched normally, and no evidence of infection could be found in the chickens.—C. HORTON SMITH.

DAS-GUPTA, M. (1938). **Observations on a Coccidium,** *Eimeria columbae* **n.sp. from the Intestine of the Indian Pigeon,** *Columba intermedia.*—*Arch. Protistenk.* **91.** 106-109. [6 refs.] [In English].

A coccidian belonging to the genus *Eimeria* was discovered on examination of the intestinal contents of pigeons in Bengal, being located in the small intestine and caeca. It differed from the previously described species, *E. labbeana*, in the presence of oocyst residue and ellipsoidal sporocysts without caps. The oocysts measured $16{\cdot}4\mu \times 14{\cdot}35\mu$ in diameter, and required a sporulation time of 4-5 days. —C. HORTON SMITH.

I. BOUGHTON, D. C., BOUGHTON, Ruth B., & VOLK, J. (1938). **Avian Hosts of the Genus Isospora (Coccidiida).**—*Ohio J. Sci.* **38.** 149-163. [Num. refs.]

II. BOUGHTON, D. C., & VOLK, J. J. (1938). **Avian Hosts of Eimerian Coccidia.** —*Bird-Banding.* **9.** 140-153. 1 fig. [Numerous refs.]

I. Species of *Isospora* are recorded from 176 species and sub-species belonging to nine orders of birds, ranging from the Falconiformes to the Passeriformes. Of these records over half are from newly-recorded avian hosts. It was found that the genus *Eimeria* was usually associated with the " lower " orders [for example, the Galliformes] while the genus *Isospora* was found to be present in " higher " orders of birds like the Passeriformes.

II. Species of *Eimeria* were recovered from 37 species of birds from eight orders. The classified list of coccidia is of value in that it tabulates descriptive notes of the species and their distribution as well as referring readers to the relevant literature. Species from ducks, geese, swans, game-birds, and domestic fowls are included.—C. HORTON SMITH.

HEGNER, R., & WOLFSON, F. (1938). **Association of** *Plasmodium* **and** *Toxoplasma*-**Like Parasites in Birds.**—*Amer. J. Hyg.* **28.** 437-454. 11 figs., 1 table. [Numerous refs.]

Observations and experiments were made in order to ascertain whether the

bodies which occur in the endothelial cells of birds infected with malarial parasites are schizonts of a *Plasmodium* or the sign of an infection with a second parasitic species resembling a toxoplasm. Endothelial invasion was found associated with *Pl. relictum*, *Pl. nucleophilum*, *Pl. cathemerium*, and *Pl. elongatum*, but was not present in infection with certain strains of *Pl. relictum* and *Pl. cathemerium* or in infections with other species of *Plasmodium*. Attempts to separate this toxoplasma-like infection from the plasmodium infection by subinoculation, transmission through *Culex pipiens*, treatment with quinine, centrifugation, or treatment of material by methods designed to destroy plasmodia but not toxoplasms, were all unsuccessful. This failure to separate the infections is not considered conclusive evidence that the endothelial forms are not due to a second parasite, as it is considered that knowledge of the epidemiology of toxoplasms is defective.

As a rule, canaries recover from malaria, but all the birds in which toxoplasma-like bodies were detected died. It may be that the development of an exo-erythrocyte schizogony cycle is associated with the tendency to produce serious illness.—U. F. Richardson.

Cardona, L. (1936). " Babesia bovis " e corpi anaplasmoidi in un focolaio di piroplasmosi nelle Marche. [**Bovine Piroplasmosis and Anaplasmoid Bodies in Cattle in Sanseverino, Italy**].—*Arch. ital. Sci. med. colon.* **17.** 614-620. 2 figs. [17 refs.]

C. describes infection in two bovines kept in stalls where others of the same herd had died with similar symptoms, which appeared after slight and not very exhausting work.

At P.M. examination the blood was light red and watery and there were haemorrhagic infiltrations in the subcutaneous connective tissue. The liver and spleen were enlarged and congested, and the kidneys were blackened and easily decapsulated.

Ticks collected in the stalls were found to be *Dermacentor spp.* Material from the spleen, liver and kidneys, stained with Giemsa and May-Grünewald-Giemsa, contained *Babesia bovis*. Anaplasmoid bodies observed were considered to be developmental forms of the babesia.

Saunié, M. (1938). Contribution à l'étude de la nuttaliose en France. [**Nuttallia Infection in France**].—*Bull. Acad. vét. Fr.* **11.** 274-276. [4 refs.]

Two cases of nuttalia infection are described in adult horses which were being used for hyperimmunization work with anaerobes.—F. H. Manley.

—. (1938). **Studies in Anaplasmosis.**—*Rep. Kans. agric. Exp. Sta.* No. 1. pp. 32. 2 tables. [Numerous refs.]

This report embraces a large variety of experiments which have been carried out on anaplasmosis of cattle in Kansas since 1928. Out of 12 experimentally infected cattle which received no treatment, two died ; recovered animals proved resistant to infection. Calves inoculated with infected blood acquired a resistance and became carriers. Experiments with flies (tabanids) as possible vectors were negative. Sheep were able to transmit the infection six months after they had been inoculated. The infectivity of the blood was destroyed by 0·1-0·5 % formalin, and the treated blood showed no immunizing value. Laked blood, refrigerated for 14 days, lost its infectivity and failed to immunize. Mercurochrome was of value in effecting a prompt recovery in acute attacks, but various other drugs which were tested were without effect. A number of other experiments are also described.—S. J. Gilbert.

CONTI, G. (1936). Anaplasmosi nei bovini della Colonia Eritrea. [**Bovine Anaplasmosis in Eritrea**].—*Arch. ital. Sci. med. colon.* **17.** 302-303.

C. reports the discovery of *Anaplasma marginale*, either alone or with *Babesia bigemina*, *B. bovis* or *Theileria mutans*, in the blood of cattle infected with rinderpest. C. considers that cattle become immune to *A.m.* following an infection during calfhood, and that the reappearance of the parasites is due to the weakening of the immunity as the result of infection with rinderpest. Actual disease due to the organism is rare.

FÜSTHY, O. (1938). Untersuchungen über das Vorkommen der Balantidiosis in Ungarn. [**Balantidiosis in Hungary**].—*Zbl. Bakt. I. (Orig.).* **142.** 133-137. 2 tables. [7 refs.]

F. discusses the importance of balantidiosis in Hungary, and states that whilst three cases of human infection have been recorded there, no investigation into porcine infection has been undertaken. He examined 100 swine by suspending 50 g. of faeces in gauze in normal saline in a funnel fitted with a long rubber tube and stopcock; after 4-6 hours' incubation the balantidia migrated through the gauze to the stopcock and could be detected by microscopic examination of fluid from that point. He was thus able to demonstrate that 91 % of the swine were affected with either *Balantidium coli* or *Bal. suis*. Examination of 160 human beings revealed infection in a woman employed in tripe cleaning, but she exhibited no disease symptoms. F. was able to demonstrate experimentally that normal stomach juices or weak hydrochloric acid have an adverse effect on the vitality of *Bal. coli* and probably prevent infection, and to show that the infected woman exhibited gastric hypo-acidity, a condition which has been recorded in other cases of human balantidiosis.—U. F. RICHARDSON.

LEVINE, N. D., DUNLAP, G. L., & GRAHAM, R. (1938). **An Intracellular Parasite Encountered in Ferret.**—*Cornell Vet.* **28.** 249-251. 1 fig. [1 ref.]

A small intracellular parasite resembling a *Cryptococcus* and an *Encephalitozoon* was found in the lungs, liver and spleen of a ferret which had been used for hunting rats and rabbits. It is suggested that the animal may have become parasitized by an *Encephalitozoon* as a result of eating rabbits' heads, as *E. cuniculi* is found in the brain of rabbits. Alternatively, it is suggested that the intracellular parasite seen in the organs examined was a new species of *Cryptococcus* confined to the ferret, or an already described species of this organism in an unusual host. No experimental animals were inoculated.—L. E. HUGHES.

BARRAIRON, E. (1938). Contribution à l'étude étiologique de l'anasarque du boeuf. [**Aetiology of Bovine Anarsarca**].—*Thesis, Toulouse.* pp. 70. 9 figs. [Numerous refs.]

This is an account of a condition occurring in enzootic form in herds in southern France. The condition is characterized by high temperature and oedema of the limbs in the early stages, later followed by scleroderma. B. discusses the various theories as to aetiology, and arrives at the conclusion that the cause is a sporozoan belonging to the genus *Globidium*, described by BESNOIT and ROBIN (1912). The life-history of the organism is still unknown, but possibly insects play a role as vectors. The disease can be reproduced by the inoculation of blood from affected animals in the febrile stage. An account of measures recommended for prevention and treatment is given.—N. J. SCORGIE.

DISEASES CAUSED BY VIRUSES

LOMBARDI, L. (1936). Sull'importanza dei germi di complicazione nell'afta epizootica. [**The Importance of Secondary Bacteria in Foot and Mouth Disease**].—*Nuova Vet.* **14.** 190-195. 1 table.

During an outbreak of F. & M. disease in Bologna province in 1934-1935, L. made cultural examinations of the liver, spleen, kidneys, heart, lungs, mesenteric lymph nodes, brain, and one long bone, of affected animals. The cultures were made in agar and serum agar, and the bacteria were identified on selective media such as Gassner's medium, Drigalski-Conradi medium and media containing glucose, lactose and mannite. The following bacteria, in order of frequency, were identified :– *Bact. coli*, staphylococci, streptococci, diplococci, and in one case each, *Salmonella paratyphi* and *Pseudomonas pyocyanea.*

Bact. coli was found in each of the organs named, staphylococci mainly in the myocardium and kidneys, and the streptococci in the liver, lungs and mesenteric lymph nodes. In the more marked lesions in the liver and kidneys there were usually mixed infections. [The carcasses were taken to the institute for this purpose; no details are given concerning the interval between death and the preparation of the culture].

I. MANSEAU, A. (1938). Considérations sur les moyens de lutte à opposer à la fièvre aphteuse. [**Control of Foot and Mouth Disease in France**].—*Rec. Méd. vét.* **114.** 660-670.

II. RINJARD, P. (1938). Prophylaxie spécifique et moyens de lutte contre la fièvre aphteuse. [**Specific Prophylaxis and Other Methods of Controlling F. & M. Disease**].—*Ann. Méd. vét.* **83.** 193-225, and 263-270. [Num. refs.]

III. ROSSIGNOL, L. (1938). Vaccination anti-aphteuse par le procédé Lignières. [**Lignières' Method of Vaccination against F. & M. Disease**].—*Bull. Soc. vét. prat. Fr.* **22.** 164-167.

IV. REY, C. (1938). La prophylaxie de la fièvre aphteuse. [**Prophylaxis of F. & M. Disease**].—*Thesis, Lyons.* pp. 66. [18 refs.]

V. AGHSSA, M. (1938). Des méthodes de l'immunisation anti-aphteuse. [**Methods of Immunization against F. & M. Disease**].—*Thesis, Alfort.* pp. 91. [Numerous refs.]

I. During the recent epizootic of F. & M. disease in France, the author obtained very favourable results by the injection of cattle exposed to infection with large doses of blood from recovered animals, followed 24 hours later by an inoculation with virulent lymph.

II. In this article the author reviews the various methods of controlling F. & M. disease under the following headings :– nature, duration and fluctuations of immunity, plurality of virus, passive and active immunization, serum-vaccination, and haemo-vaccination.

III. An official trial of the method of vaccinating cattle against F. & M. disease described by LIGNIÈRES [*V. B.* **4.** 512.] failed to demonstrate conclusively that it was completely efficacious. This result is in keeping with the opinion widely held in France that there is no certain method of vaccination which will rapidly immunize animals against the disease without a risk of creating new foci of infection. The author points out that important details regarding the method of preparation of the attenuated virus used for vaccination were not divulged by J. LIGNIÈRES. Similarly, R. LIGNIÈRES, who has reduced the number of injections from three to two, has failed to give precise details of the technique which has enabled him to dispense with one of the injections.

IV. The author describes the use of immune serum from recovered animals during a recent epizootic of F. & M. disease in France. Satisfactory results were obtained in arresting the disease in animals exposed to infection, provided sufficiently large doses were given.

V. A brief summary of the present position, with no original observations.
—R. E. GLOVER.

I. PIENING, C. (1938). Maul- und Klauenseuche und Enteritiserkrankungen beim Rinde. [**Foot and Mouth Disease and Enteritis in Cattle**].—*Berl. Münch. tierärztl. Wschr.* Nov. 11th. 688. 1 table.

II. WITTE, J. (1938). Gehäufte Breslau-Infektionen bei Rindern im Anschluss an Maul- und Klauenseuche. [**The Incidence of Salmonella Infection in Cattle in Association with F. & M. Disease**].—*Z. Fleisch- u. Milchhyg.* **49.** 103-104.

I. On the examination of 4,059 bovine carcasses for paratyphoid infection during 1938, P. detected infection in 3·8% of adult cattle slaughtered on account of F. & M. disease, against a rate of 2·54% in uninfected adults. In calves, the paratyphoid infection in carcasses of animals slaughtered for F. & M. disease was 8·54%, against a rate of 5·46% in other calf carcasses. It was noticeable that in the case of adult carcasses infected with F. & M. disease, 55% of the detected salmonella infections were confined to the gall-bladder or lymph nodes.

II. W. records the detection of infection with *S. enteritidis* in three cows, all from one farm, which had been slaughtered for F. & M. disease. In one case this infection occurred in the muscles of the fore and hind quarters, whilst in the others it was only detected in the lymph nodes, spleen, kidneys and liver. In all three cases the bone-marrow was infected. It is discussed whether all three animals were carriers of the organism during life, or whether the infection might have been derived from one animal, the other carcasses being contaminated in the abattoir. Examination of the farm concerned failed to reveal any *S.e.* infection. It is suggested that this incident illustrates the importance of bacteriological examination of all cases of emergency slaughter, and that all precautions should be taken in an abattoir to prevent contamination of other carcasses from those of carriers of infection.
—U. F. RICHARDSON.

I. FORSSELL, G. (1939). Om mul- och klövsjukans smittämne. [**The Virus of Foot and Mouth Disease**].—*Manadsbl. skand. Kreaturoförsäkringsbol.* **17.** 1-2.

II. MAGNUSSON, H. (1939). Mulsjukeserum av stor betydelse för att lindra sjukdomen. Oeverveterinär Pålsson har konstruerat en billig och praktisk serumspruta. [**An Injection Pump for Administration of Serum for Immunizing against F. & M. Disease**].—*Ibid.* 2-3. 3 figs.

III. ANON. (1939). Mul- och klövsjukans verkliga läge alltjämt kritiskt. Farsotens låge i statistick belysning. [**The F. & M. Disease Situation in Europe**]. —*Ibid.* 4-10. 5 charts, 3 maps.

IV. ANON. (1939). Intressanta uttalanden av lantbrukare, vilkas besättningar drabbats av mul- och klövsjuka. Risken för följdsjukdomar minskas genom omsorgsfull djurvård. [**Losses from F. & M. Disease Reduced by Care on the Part of the Farmer**].—*Ibid.* 11-12.

V. EDIN, H. (1939). Mjölk som fodermedel åt vuxna nötkreatur, speciellt inom besättningar, som isolerats på grund av mul- och klövsjuka. [**Milk**

as Food For Adult Cattle, Especially in Herds Isolated during an Outbreak of F. & M. Disease].—*Ibid.* 13-15. 1 table.

I. A popular survey is given of the properties of the virus, resistance to infection, and different methods for the control of the disease.

II. The value of convalescent serum is referred to and a description is given of a special type of injection pump.

III. Graphs show how the epizootic spread from France to Sweden, where in December, 1938, 900 herds became infected in one week. During this period the stamping out method was given up in the two southern counties of Sweden.

IV. Emphasis is laid on the importance of good hygienic conditions when animals are allowed to recover from F. & M. disease.

V. When herds are maintained in isolation during F. & M. disease outbreaks, it is generally necessary to use the milk as food for the adult cattle. After a week cows generally become accustomed to drinking the milk, and it may then be given with other concentrated foods.—H. C. Bendixen (Copenhagen).

—. (1938). Zwalczanie pryszczycy w swietle ustawodawstwa. [**Regulations for the Control of F. & M. Disease in Poland**].—*Przegl. wet.* **53.** 273-279.

According to the laws of August 22nd, 1927, on infectious animal diseases, and of January 9th and April 1st, 1928, animals affected with F. & M. disease are to be slaughtered when such measure will enable the outbreak to be checked, and the cost is borne by the government.

Control measures against possible infection are detailed. A zone with a radius of 15 km. is declared infected. When an outbreak occurs in a neighbouring country at any point less than 20 km. from the frontier, a belt 40 km. wide within the Polish frontier is placed under restrictions. When the infection is spread over a large area vaccination is advised. Details are given of the action taken to deal with outbreaks.

Cats, dogs, poultry and pigeons which cannot be isolated must be killed. There must be no traffic with the infected district until three weeks after the disease has died out.

Details are given concerning disposal of manure and methods of disinfection.

Wicktor, C. E., & Coale, B. B. (1938). **Vesicular Exanthema.**—*Vet. Med.* **33.** 516-518.

The authors describe the virus disease of pigs in California which is clinically indistinguishable from foot and mouth disease [*V. B.* **7.** 114]. It occurs in garbage-fed animals. During a short course characterized by fever and anorexia, multiple vesication occurs on the snout, lips, oral and nasal mucosa, coronary region and udder. Ulceration, sloughing, and shedding of the hoofs may result. Less acute outbreaks occur, but in all cases the mortality is low. The disease can be transferred experimentally to horses, in which it assumes a very mild form.

For differential diagnosis experimental inoculation of test animals must be relied upon—the susceptibility of horses to vesicular exanthema and vesicular stomatitis, but not to F. & M. disease, and the susceptibility of cattle and g. pigs to vesicular stomatitis and F. & M. disease, and not to vesicular exanthema.
—D. D. Ogilvie.

Girard, H. (1938). Essai de vaccination contre la péripneumonie à l'aide de la sérosité pleurale incorporée dans la lanoline. [**Vaccination against Contagious Bovine Pleuro-Pneumonia with Pleural Exudate in Lanoline**].—*C. R. Soc. Biol. Paris.* **129.** 590-593. [7 refs.]

The addition of lanoline to toxins and vaccines in order to obtain greater

antibody response has been described by various workers. G. gives an account of experiments to ascertain if any ill effects follow the injection of the virus of contagious bovine pleuro-pneumonia in lanoline and whether such injection immunizes. The vaccine was prepared by mixing 5 g. of lanoline with 2 c.c. of virus obtained from the pleural cavity of animals killed during an attack of the disease ; 15-18 c.c. of ground nut oil were added to facilitate injection. Subcutaneous inoculation in the neck or behind the shoulder was followed by some local reaction, which tended to subside after 7-8 days. There was considerable evidence of the production of immunity, but more tests must be made before definite conclusions to be made as to the value of the method and the duration of immunity.—S. J. GILBERT.

JEZIC, J. (1938). La peste porcine est-elle transmissible aux moutons ? [**Possible Transmission of Swine Fever to Sheep**].—*Rec. Méd. vét.* **114.** 714-717.

A brief review is given of some attempts that have been made to transmit S.F. to other animals by artificial methods, and some positive results are reported. The author does not report on his own work. Sheep and goats are reported also to have contracted natural infection. Virus mixed with that of sheep pox and passaged through sheep, produced S.F. when inoculated into pigs. Some multiplication of the S.F. virus is said to have taken place.—F. H. MANLEY.

HUPBAUER, A., & SKOKOVIC, L. (1938). Prilog epizootiologiji svinjske kuge. Da li ovce igraju kod širenja svinjske kuge izvjesnu ulogu ? [**Epizootology of Swine Fever. Possible Role of Sheep in the Spread of the Disease**].—*Vet. Arhiv.* **8.** 453-459. [9 refs.] [French summary].

The authors examined JACOTOT's statement [*V. B.* **8.** 288.] that sheep may be susceptible to S.F. virus and that they may spread it to pigs.

They found that S.F. virus will persist in the blood of sheep, following either subcutaneous or intratesticular inoculation, for at least 16 days, but not for 30 days. No evidence of the multiplication of the virus in the sheep could be ascertained. Pigs kept with such infected sheep remained healthy. It was found that 1 c.c. of the virus from the sheep would infect pigs even after a dilution of 1:6,000,000. —B. OSWALD (KRIŽEVCI).

VONČINA, D. (1938). Prilog serodijagnostici svinjske kuge. [**On the Sero-Diagnosis of Swine Fever**].—*Jugoslov. vet. Glasn.* **18.** 143-148. 4 tables. [6 refs.] [German summary].

The value of Cuverkalov and Kucerenko's [Zuwerkalow and Kutscherenko's] method for the sero-diagnosis of S.F. by means of the urine [*V. B.* **5.** 574.] was examined in 96 healthy and infected pigs. The results here reported failed to support the claims of these authors.—B. OSWALD (KRIŽEVCI).

I. BUMÜLLER, E. (1937). Untersuchungen über eine Vereinfachung des diagnostischen Kaninchenversuches bei der ansteckenden Blutarmut des Pferdes. [**A Simplification of the Rabbit Test in the Diagnosis of Equine Infectious Anaemia**].—*Inaug. Diss., Hanover.* pp. 48. 24 tables. [Numerous refs.]

II. MÖNKEMEIER, A. (1937). Weitere vergleichende Untersuchungen über die Vereinfachung des Kaninchenversuches für die Diagnose der ansteckenden Blutarmut des Pferdes. [**Simplification of the Rabbit Test in the Diagnosis of E.I.A.**]—*Inaug. Diss., Hanover.* pp. 34. 10 tables, 10 charts. [Num. refs.]

III. PETERS, T. (1937). Weitere Beiträge zur Diagnose der ansteckenden Blutarmut der Pferde mit Hilfe des Kaninchenversuches. [**The Rabbit**

Test in the Diagnosis of E.I.A.]—*Inaug. Diss., Hanover.* pp. 51. 24 figs., 24 tables. [Numerous refs.]

IV. PRESSER, H. (1937). Der Wert des Kaninchenimpfversuches für die Epidemiologie der ansteckenden Blutarmut der Pferde. [**The Value of the Rabbit Inoculation Test in the Epidemiology of E.I.A.**]—*Inaug. Diss., Hanover.* pp. 107. 32 tables, 32 graphs. [Numerous refs.]

I. B. introduced E.I.A. virus into rabbits subcutaneously or into the rectum, and in each case injected 3 c.c. of a 1% alcoholic solution of phenylhydrazine (subcut.) three days later; phenylhydrazine causes a chronic anaemia. After six days he demonstrated in the liver appreciable amounts of iron, which, according to some authors, is absent from the normal rabbit liver. It is suggested that unless further experiments show that iron is also deposited in the liver of rabbits inoculated with healthy horse serum, this procedure may serve as a test for the diagnosis of E.I.A.

II. M. describes similar experiments in which it is stated that rabbits were successfully infected with E.I.A. when inoculated (subcut.) with 1 c.c. of serum from diseased horses, even without subsequent injection of phenylhydrazine [see I, above]. He confirmed the occurrence of iron deposits in the liver of the rabbits so treated, but the amounts he found, except in one case, were extremely small. This was considered to be due to the fact that the rabbits were killed for examination too long (10-16 days) after the phenylhydrazine injection.

III. The serum of horses with no definite clinical symptoms of E.I.A., but whose blood reacted positively to the mercuric chloride test, caused the same changes in the blood picture of rabbits, injected *per rectum*, as did serum from horses known to be affected with the disease. P. concludes, therefore, that horses reacting positively to the mercuric chloride blood test should be suspected as carriers of E.I.A. In further experiments the blood picture of rabbits was affected by the subcutaneous injection of 1 c.c. or more of porcine serum; the effect produced was therefore not of a specific nature. [The author apparently considers that the rabbit can be infected with the virus of E.I.A.]

IV. P. states that he was able to demonstrate by inoculating rabbits (subcut. or *per rectum*) with the serum of 17 horses from a farm in the Saarbrücken district, that all were infected with E.I.A. The clinical history of the horses and three blood tests of each made during the two preceding years had provided no definite evidence as to whether they were infected or not.

BALOZET, L. (1938). Études expérimentales sur l'anémie infectieuse des équidés (V). Action du ricinoléate de soude, de l'enrobage et de l'inoculation de faibles doses. [**Equine Infectious Anaemia. (V). Effect of Sodium Ricinoleate on the Virus, Effect of Suspension in Fat and Effect of Inoculation of Weak Doses**].—*Arch. Inst. Pasteur Tunis.* **27.** 189-192. [4 refs.] [See also *V. B.* **8.** 153.]

Virulent serum from an affected donkey was mixed with sodium ricinoleate (1:250 and 1:500); the mixture was kept for 15 minutes and was then inoculated into donkeys. The animals did not contract the disease, and they did not acquire immunity. Two donkeys were inoculated with three doses of 0·3 c.c. each of virulent serum at three-day intervals. Two other donkeys were given subcutaneously 4 c.c. of virulent serum incorporated in an oily excipient. In both experiments similar results were obtained; a mild form of the infection developed in one animal and a very severe attack was manifested in the other. No attenuation of the virus was observed.—E. C. HULSE.

STAMATIN, N. (1938). L'action du sérum immun sur le virus de la clavelée. [**Action of Immune Serum on Sheep Pox Virus**].—*C. R. Soc. Biol. Paris.* **127.** 635-637. [1 ref.]

Sheep pox virus was treated with varying amounts of immune serum in the presence of charcoal. After centrifugation, the sediments, tested on sheep, were still virulent. It is suggested that the charcoal selects the virulent elements from inert serum-virus mixtures.—R. E. GLOVER.

GRIMPRET, J. (1938). La variole de la chèvre au Maroc. [**An Outbreak of Goat Pox in Morocco**].—*Rec. Méd. vét. exot.* **11.** 105-112. [2 refs.]

G. first encountered goat pox in Morocco in 1932. An epizootic recurred in 1938 in the same region and he gives a detailed description of the disease. An experiment on vaccination with pox scabs of 15 goats gave indefinite results, as neither these animals nor unvaccinated controls could be infected, possibly owing to the low virulence of the virus at the end of the epizootic.—S. J. GILBERT.

ØRSKOV, J., & ANDERSEN, Else K. (1938). Weitere Untersuchungen über die Bildungsstätten der virusneutralisierenden Stoffe bei Vaccineinfektion von Kaninchen. [**The Production Site of Neutralizing Antibodies in Rabbit Pox**].—*Acta path. microbiol. scand.* Suppl. No. 37. 621-631. 6 tables. [In German].

The authors claim to have proved that when rabbits are infected by intratesticular injections with rabbit pox virus, antibodies are present earlier and to a higher titre at the local site of infection than when the infection is by the dermal route.—E. J. PULLINGER.

REIS, J., & NOBREGA, P. (1937). Sobre um virus tripathogenico de bouba de canario. [**A Pox Virus from Canaries**].—*Arch. Inst. biol. Def. agric. anim., S. Paulo.* **8.** 211-214. 3 figs. on 2 plates. [10 refs.] [English summary].

A strain of fowl pox virus pathogenic for chicks, pigeons and passerine birds (small singing and perching birds) is described; it was isolated from *Serinus canarius* and *Sicalis flaveola*, which were seriously affected, the mortality being 98%. The strain of virus immunized against a known fowl pox virus and a known pigeon pox virus.—S. TORRES.

HELLESNES, P. (1938). Hvalpesyke hos sølvreven. [**Distemper in Silver Foxes**].—*Norsk VetTidsskr.* **50.** 625-632. 1 fig. [1 ref.]

The article is a preliminary report of investigations on distemper of the silver fox, carried out by H. during recent years at the State Veterinary Clinic, Oslo, and is published to provide veterinary practitioners with information concerning the clinical picture of this disease new to Norway. The first outbreaks occurred in 1936, and since then the infection has somewhat increased. A royal decree issued in 1938 made the notification of the disease compulsory.

H. describes the symptoms in foxes, which are similar to those observed in dogs, *i.e.*, of a catarrhal as well as a nervous nature; this is also the case when the distemper is associated with salmonella infection, a complication frequently observed. Differential diagnosis and means of spread are also discussed. In adult foxes the mortality may reach 20%, but is usually much lower. In young cubs, however, the mortality may reach nearly 100%, especially when salmonella infection is also present.

Dog distemper vaccine and dog distemper antiserum produced in England proved ineffective in protecting foxes against distemper, but " Behringwerke " dog distemper antiserum was of considerable prophylactic value.

The type of fox distemper here described was found to be not quite identical with the type reported from Sweden by CARLSTRÖM and SVENSSON [*V. B.* **8.** 704.]
—GUSTAV NAERLAND (OSLO).

—. (1938). Conférence internationale de la rage tenu à Bucarest du 6 au 11 mai 1938. [**International Conference on Rabies held at Bucarest (May, 1938)**]. —*Bull. Off. internat. Epiz.* **17.** 59-61.

A conference of the representatives of eight countries at Bucarest recommended various measures designed to ensure collaboration between different Institutes and countries, and to further intensive study of the virus and other conditions concerning rabies.—S. J. GILBERT.

GERLACH, F. (1938). Virusstudien bei Tollwut. [**Studies of the Virus of Rabies**]. —*Z. InfektKr. Haustiere.* **53.** 279-290. 7 figs. [10 refs.]

A study of the histological changes which follow both natural and artificial infections with street, passage, and fixed rabies virus. The study was largely concentrated upon small granular bodies, which were thought to be virus particles, found in the central nervous system, meningeal fluid, salivary glands and serosa. Similar bodies were seen in preparations made from virus egg-cultures.—E. J. P.

REMLINGER, P., & BAILLY, J. (1938). Le rapport chloré érythroplasmatique dans la rage expérimentale du chien et du lapin. [**The Ratio of Chlorine between Plasma and Erythrocytes in Experimental Rabies in Dogs and Rabbits**].—*Maroc. méd.* **18.** 414-415. 2 tables.

Experiments were carried out on 30 dogs and 10 rabbits, the observations being made prior to inoculation and at the end of paralysis. The variation in the ratio showed an increase in all cases; the increase in the corpuscular chlorine content being greater than that in the plasma.—F. H. MANLEY.

I. FRANCIS, T., Jr. (1938). **The Immunology of Epidemic Influenza.**—*Amer. J. Hyg.* **28.** 63-79. [Numerous refs.]

II. FRANCIS, T., Jr., & STUART-HARRIS, C. H. (1938). **Studies on the Nasal Histology of Epidemic Influenza Virus Infection in the Ferret. I. The Development and Repair of the Nasal Lesion.**—*J. exp. Med.* **68.** 789-802. 26 figs. on 4 plates. [Numerous refs.]

III. STUART-HARRIS, C. H., & FRANCIS, T., Jr. (1938). **Studies on the Nasal Histology of Epidemic Influenza Virus Infection in the Ferret. II. The Resistance of Regenerating Respiratory Epithelium to Reinfection and to Physicochemical Injury.**—*Ibid.* 803-812. 12 figs. on 2 plates, 1 table. [12 refs.]

IV. FRANCIS, T., Jr., & STUART-HARRIS, C. H. (1938). **Studies on the Nasal Histology of Epidemic Influenza Virus Infection in the Ferret. III. Histological and Serological Observations on Ferrets Receiving Repeated Inoculations of Epidemic Influenza Virus.**—*Ibid.* 813-830. 6 figs. on 1 plate, 4 tables, 1 chart. [5 refs.]

V. FRANCIS, T., Jr. (1939). **Quantitative Relationships between the Immunizing Dose of Epidemic Influenza Virus and the Resultant Immunity.**—*Ibid.* **69.** 283-300. 4 tables, 1 chart. [12 refs.]

I. The author summarizes current views regarding epidemic human influenza. He points out that the problem of immunity is complicated by several factors. In some instances, simultaneous outbreaks of clinical influenza in many parts of the world appear to be due to viruses transmissible to the ferret and showing close

antigenic affinities. In other instances, strains which from the immunological standpoint are quite dissimilar, may be obtained from localized outbreaks. In addition, he suggests that the supposed lack of immunity and the recurrence of epidemics of influenza may not be due to an absence of resistance to the virus, but to the existence of an influenza syndrome in which a virus pathogenic for the ferret cannot be obtained.

Clinical and experimental data show clearly that a state of resistance may exist in a population over a period of several years. This immunity is apparently not entirely dependent upon demonstrable antibodies, but may be due to changes in the cells of the respiratory tract.

II. Following intranasal instillation of influenza virus in the ferret, there is almost complete destruction of the respiratory epithelium between the 24th and 48th hours. Reparative changes commence about the sixth day, firstly in the form of the development of a differentiated stratified squamous epithelium, and later by the presence of a stratified columnar ciliated epithelium.

III. During the period immediately following necrosis of the nasal epithelium the mucosa is completely refractory, not only to further instillations of influenza virus but also to severe physico-chemical injury induced by a 1 % solution of zinc sulphate accompanied by a weak galvanic current. This resistance is attributed to the presence of the transitional squamous epithelium, since as soon as normal cells develop (21 days), susceptibility to injury by both agents is restored.

IV. Ferrets were exposed to repeated intranasal instillations of virus at varying intervals, but no evidence was obtained that any permanently modified epithelium with enhanced resistance was produced. Further experiments suggested that there was a parallelism between the titre of neutralizing antibodies and resistance to infection as determined by histological study, *i.e.*, that circulating antibodies tended to protect the cellular structures.

V. Preliminary experiments in mice showed that amounts of influenza virus in dilutions varying from 10^{-3} to 10^{-4} given intraperitoneally afforded nearly complete immunity, whereas with smaller doses the protection was of a lower order. A striking relationship was observed between the dose of virus used for vaccine and the amount of test virus required to produce severe lesions.

In ferrets, the titre of the circulating antibodies depended upon the quantity of virus contained in the vaccinal dose, the minimum amounts required being about 100 intranasal infecting units. Partially immune ferrets with low circulating antibodies often responded to an intranasal infection. The antibodies then rose to a much higher level than after a primary infection.—R. E. Glover.

Zinsser, H., Wei, H., & Fitzpatrick, F. (1938). Nouvelles méthodes du culture de *Rickettsiae* du typhus à propos de la production de vaccins. **[New Methods of Cultivating Rickettsia for the Production of Typhus Vaccines].** —*C. R. Soc. Biol. Paris.* **127.** 229-232. 1 fig. [7 refs.]

Formolized cultures of the *Rickettsia* of murine typhus have given satisfactory results as vaccines in practice, but there has been a difficulty in producing large quantities by Nigg and Landsteiner's method of culture [*V. B.* **3.** 83.], as the rickettsia will only multiply in cells and yet if large quantities of cells are added to the medium no growth of rickettsia occurs. This failure of multiplication was found to be due to the production of acid by the metabolic activity of the cells.

A method is now described in which a medium of 4 % agar dissolved in equal quantities of horse serum and Tyrode solution is placed in a test tube and covered with cells. The reaction of the medium is adjusted to pH 7·6-7·8. The tube is closed by a cork pierced by a capillary glass tube through which fluids can be

introduced to correct the production of acid. The rickettsia commence to multiply rapidly on the fifth day, and by the tenth day a quantity is obtainable ten times greater than that from a Maitland flask.—U. F. RICHARDSON.

CLAUDE, A. (1936). L'action de la trypsine cristallisée sur l'agent d'un sarcome aviaire transmissible. [**Action of Crystallized Trypsin on the Agent of a Transmissible Avian Sarcoma**].—*Ile Congr. internat. Cancer, 1936.* pp. 88-92. 1 table. [12 refs.]

C. describes the action of two proteolytic enzymes, isolated from the pancreas, on the active principle of sarcoma-extract in fowls. The crystallized trypsin inactivated the growth of the tumour. The crystallized carboxypolypeptidase, under the same conditions, had no action. In relation to the proteolytic action of the trypsin, the sarcoma agent behaved like a protein.

PARASITES IN RELATION TO DISEASE [GENERAL]

HÜLPHERS, G., & LAGERLÖF, N. (1938). De viktigaste parasitsjukdomarna hos får och deras bekämpande. [**Control of Important Parasitic Diseases of Sheep**].—*Svensk VetTidskr.* **43.** 211-242. 17 figs. [3 refs.]

The paper is a survey of the most frequently occurring intestinal, hepatic, pulmonary and dermal parasites in sheep, giving short descriptions of the most characteristic clinical and pathological disturbances they cause. The authors give an account of the existing methods of control by prophylactic and curative treatment.—GUSTAV NAERLAND (OSLO).

—. (1937). **Report of Committee of Parasitic Diseases [U.S. Live Stock Sanit. Inst.]**—*J. Amer. vet. med. Ass.* **90.** 346-352.

Notable progress was made in the control of parasites of swine, sheep and cattle during 1936. The application of hygienic measures resulted in greatly reduced infestations of swine with various parasites and also in the production of better types of hogs. In the control of liver fluke, spraying the ground with copper sulphate is only a temporary expedient, but drainage of the land is most effective and also improves the quality of the pasture as well as acting as a mosquito control measure. Screw-worm (*Cochliomyia americana*) infestation is of particular danger on account of the rapidity with which one affected animal can spread the parasite to others. Animals should be treated before shipment to prevent the introduction of the parasite into uninfested districts.

Worm infestation of chickens was a serious problem. Roundworms can be controlled by hygienic measures, but tapeworms are more difficult to deal with, on account of the nature of the intermediate hosts concerned. Several strains of fowl were produced which had a marked resistance to infection with *Ascaridia lineata*.—HUGH N. SPEARS.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

SIMMONS, S. W. (1937). **Some Histopathological Changes Caused by *Hypoderma* Larvae in the Esophagus of Cattle.**—*J. Parasit.* **23.** 376-381. 6 figs., 2 tables. [6 refs.]

Histological studies were made of the oesophagus of cattle infested with larvae of *H. lineatum*, the material being obtained from an abattoir. The larvae normally

occurred in the submucosa and caused an inflammatory oedema, which distorted the submucous connective tissue and occasionally invaded the muscularis mucosae. A constant feature was the presence of enormous numbers of leucocytes in the affected area. Eosinophiles predominated, but lymphocytes and plasmocytes were also numerous. The average density found was 476,365 eosinophiles per c.mm. Many of the eosinophiles were myelocytes, especially in heavy infestations. In the channels left by the larvae, dead leucocytes and fibrin were present, and in most cases the channels were surrounded with fibroblasts. It is suggested that the function of the eosinophiles is the neutralization of toxins produced by *Hypoderma* larvae.—R. P. Hobson.

Carlier, F. (1938). Lutte contre le varron des bovidés. Effets de différentes substances médicamenteuses sur la larve d'hypoderma bovis. [**Control of Ox Warbles. Effect of Various Drugs on the Larva of** *H.b.*].—*Thesis, Alfort.* pp. 51. [Numerous refs.]

From preliminary trials with larvae of *Gastrophilus intestinalis*, an extract of timbo (*Lonchocarpus nicou*) in carbon tetrachloride was chosen as a suitable insecticide for treating cattle infested with warbles. Pure carbon tetrachloride proved rapidly fatal to *Gastrophilus* larvae, and its toxicity was increased by the material extracted from timbo, which includes rotenone. A suitable emulsifier was added to the extract so that it could be diluted with water before use. Field experiments were carried out by sponging the backs of affected cattle with this preparation. One treatment was sufficient to kill the larvae; the swellings disappeared within 3-4 days, and the lesions quickly healed. It is suggested that, after the treatment, the parasites are digested and absorbed by the tissues.—R. P. Hobson.

Robinson, L. E. (1935). **Parasites of Sheep. Bulletin No. 1. The Sheep Maggot Fly.** pp. 31. 10 figs., 2 photographs, 1 appendix. London: The Cooper Technical Bureau.

The problem of the sheep maggot fly and its control in Great Britain is discussed from the viewpoint of the scientist, the flockmaster, and the shepherd.

The life-history of *Lucilia sericata* is traced, and a description is given of the infestation of the sheep. The conditions inducing attacks upon sheep include soiling of the fleece with dung, blood, or serous liquids, decomposition of skin secretions following prolonged rainy weather, dipping in badly fouled baths, and previous infestation with fly maggots. Control of the condition is difficult. Sheep grazing on open pastures are least liable to be attacked. Repellent dressings are said to be of very limited value, while hand-dressing of infested sheep is of great benefit. Dipping in arsenic-sulphur dips has both preventive and curative effect. In a bad season such dipping may have to be repeated every month. Crutching obviates soiling of the breech, but jetting, which consists in spraying the crutch and rump with arsenical dip at high pressure, is more popular. The trapping and poisoning of maggot flies are only of value if applied extensively.

The incidence of maggot fly has shown a great increase in recent years, apparently because of the mild winters and warm summers, and because of changed agricultural conditions such as the spread of bracken, the increase of deer and the more extensive keeping of ewes on low-ground arable farms.

In the appendix a number of fly-traps are described, and instructions are given for their use.—D. D. Ogilvie.

MacLeod, J. (1938). **The Tick Problem.**—*Vet. Rec.* **50.** 1245-1250. 3 figs. [8 refs.]

The problem of severe tick infestation of sheep in Great Britain is an old

established one, but recent researches have tended to focus new attention upon it. Lately the spread of ticks to new territory has occasioned some alarm, but in practice this is essentially an unimportant phase of the problem.

Various factors are set out as controlling tick survival. Of these only humidity is of moment in Great Britain. A very high moisture value is required for survival, ordinary atmospheric conditions being rapidly lethal. Such humidity occurs only in vegetation which remains deep and matted over the summer. Rough hill grazings and poorly managed pastures thus constitute the areas of spread. The obvious remedies are mixed grazing, severe harrowing, liming, burning and cutting, and sheep dipping.

Although it is probably true that a host such as the hare may sustain the tick population, the author considers it unwise to condemn all wild animals equally in this respect. Full consideration of the habits and environment of the deer, for example, will show that this animal is of little consequence in the problem, and the wholesale slaughter of herds of these animals is, therefore, unjustifiable.

—D. D. Ogilvie.

Yutuc, L. M. (1938). **Notes on a Hitherto Unreported Acarine Parasite of Carabao in the Philippines.**—*Philipp. J. anim. Indust.* **5.** 363-366. 8 figs. on 3 plates, 1 table. [6 refs.]

Owing to their predilection for mud and water, water-buffaloes are not commonly attacked by mites. The *Acarus* described, a psoropt, was recovered from a domesticated water-buffalo. A description, with diagrams, is given of the common psoropt of cattle, and from a comparative table of measurements there would appear to be little, if any, difference between this and the psoropt now described.

Attempts to transmit the mite to two horses, two water-buffaloes and one calf were unsuccessful. The symptoms and lesions caused by the mite are those of ordinary psoroptic mange.—F. J. Andrews.

PARASITES IN RELATION TO DISEASE [HELMINTHS]

Skrjabin, K. I., & Šulč, R. E. S. (1937). Gelmintozja krupnogo rogatogo skota i ego molodnjaka. [**Helminth Parasites of Cattle**]. pp. 723. 167 figs., 8 tables. [Numerous refs.] Moscow: State Publication Department for Collective and State Farms. [4to].

This is a work on systematic and practical helminthology of cattle in Russia, containing a fair number of figures and a number of selected bibliographies throughout the text.

The first part of the book (pp. 1-640) contains an elaborate systematic description of the various helminths of cattle and the diseases for which they are responsible. In each case the biology, distribution, pathogenesis and method of control are given; the more important worms such as *Fasciola*, *Cysticercus*, *Echinococcus*, *Dictyocaulus*, *Thelazia* and *Neoscaris* are dealt with, at greater length.

In the second part (pp. 643-714) the authors deal with the " diagnosis, therapy, epizoology and prophylaxis of helminthiasis in cattle ".—J. E.

Srivastava, H. D. (1938). **The Occurrence of *Paragonimus westermani* in the Lungs of Cats in India.**—*Indian J. vet. Sci.* **8.** 255-257. [10 refs.]

S. recovered two specimens of *P.w.* from the lungs of a cat in India.—R. Fisher.

SRIVASTAVA, H. D. (1938). **A New Trematode—*Prosthogonimus indicus*, N. SP. —Occurring in the Oviduct of Indian Fowls, with Remarks on 'Prosthogonimiasis'.**—*Indian J. vet. Sci.* **8.** 213-220. 3 figs. on 2 plates. [Numerous refs.]

During the examination of a number of dead fowls, S. isolated from the oviducts of two a species which he has named *Prosthogonimus indicus*. Prosthogonimiasis occurs in a large number of different species of birds, and affects only females. Egg production decreases and soft-shelled eggs are laid. The parasite usually lives in the bursa fabricii, and may occasionally be found inside apparently normal eggs. The pathological changes are mainly confined to the ovaries and oviducts, but peritonitis, emaciation and anaemia also occur. Diagnosis during life is difficult. The parasites may be removed from the intestines by the cautious use of carbon tetrachloride, but no treatment will remove them from the oviduct. —R. FISHER.

EMSBO, P. (1938). Taenia saginata. [**A Study of** *T.s.*]—*Skand. VetTidskr.* **28.** 289-312. 4 figs., 2 tables. [English summary].

The paper, which was read as a lecture on a self-selected theme at the competition for the professorship of bacteriology, meat and milk inspection (including veterinary parasitology) at the Royal Danish Veterinary College, is a treatise on the present state of knowledge concerning *T.s.*, its anatomic structure and development cycle, including the cyst form *Cysticercus bovis*. E. stresses the hygienic importance of the parasite from the human point of view, and its importance from the point of view of veterinary meat inspection.

Statistical figures from meat inspection records show that *C.b.* has occurred with increasing frequency in Danish cattle during recent years. Its incidence increased from 0·39% of the total number of ox carcasses examined in 1933 to 0·58% in 1936, *i.e.*, an increase of nearly 50%. Possible causes of this increase are discussed, and it is concluded that the present methods of controlling the parasite are ineffective and that there should be closer collaboration between the veterinary officials concerned and the medical practitioners.—G. NAERLAND (OSLO).

MUDALIAR, S. V., & IYER, K. S. G. (1938). *Pseudanoplocephala crawfordi* **Baylis 1927.**—*Indian J. vet. Sci.* **8.** 235-237. 2 text figs., 1 fig. on 1 plate. [4 refs.]

The authors record what they believe to be the first finding of adult cestodes in pigs in India. The specimens described are said to resemble in almost all details *Ps.c.* The species found would appear to be a common intestinal parasite of pigs in South India.—R. FISHER.

CHATON, M. (1938). Recherches pour servir à l'étiologie et au diagnostic de l'échinococcose alvéolaire multiloculaire du foie chez l'homme. [**Origin and Diagnosis of Multilocular Echinococcosis of the Liver in Man**].—*Rev. Path. comp.* **38.** 479-493. 1 fig. [3 refs.]

This article deals with the answers to a questionnaire concerning the incidence of multilocular echinococcosis in food animals, sent by C. to 66 veterinarians in the province of Franche-Comté and the adjoining territory of Belfort. Replies were received from 58 veterinarians; 22 of these reported a varying incidence, the majority of cases being noted in small village centres, especially in the mountainous regions of the area, rather than in the large town abattoirs.

The cysts are common in pigs, and pig flesh is eaten in an almost raw state as smoked ham; they were also noted in sheep, rabbits and in one horse.

C. speaks of an as yet untested extract of affected pig liver prepared as a diagnostic agent.—C. V. WATKINS.

MORRISON, A. E. (1938). **Prevention of Hydatids. Act Operates on 1st January.** —*N. Z. J. Agric.* **57.** 409.

The Dogs Registration Act, 1937, is intended to reduce the high incidence of hydatid disease in the Dominion. The act came into force on January 1st, 1939, when local authorities were required to supply dog-owners with arecoline hydrobromide, the prescribed remedy for treating dogs.—L. W. N. FITCH.

BACIGALUPO, G., & FRANZANI, O. F. (1936). A proposito del potere antigenico dei liquidi idatidei. [**The Antigenic Power of Hydatid Fluid**].—*G. Batt. Immun.* **16.** 872-875. [English, French and German summaries].

The authors experimented on rabbits, inoculating them with hydatid fluid taken from the sheep, ox and pig, and using the complement-fixation test to demonstrate antibodies. They conclude that hydatid fluid is still antigenic after heating for five minutes at 100°C.

BAUMGARTNER, A. (1937). Erfahrungen über Magendarmstrongylose bei den Wiederkaüern. [**Gastro-Intestinal Strongylosis in Ruminants**].—*Schweiz. Arch. Tierheilk.* **79.** 301-317. 2 figs.

After a general discussion of the literature B. describes strongylosis in the cow, goat, sheep and mountain goat. He considers that arecolin or " contortin " (areca nut and kamala preparations respectively) are good remedies, but recognizes the difficulty in effecting cures.—P. S. WATTS.

TAYLOR, E. L. (1938). **Observations on the Bionomics of Strongyloid Larvae in Pastures. I.—The Duration of Infection in Pasture Herbage.**—*Vet. Rec.* **50.** 1265-1272. 9 figs., 2 tables. [8 refs.]

The rate of disappearance of strongyloid larvae from pastures was studied under field conditions. Grass was grown from seed in boxes of sterile soil kept out of doors but screened from interference by birds and protected from slugs and snails. When the grass was 2-3 in. high the soil was sown with infective larvae. The latter were recovered by cutting the grass, shaking it in water, and examining the sediment.

It was found that the larvae ascended the grass rapidly and suffered great losses during the first few weeks. Some died during the first 24 hours. The longest lived larvae were those which remained on the leaf sheaths and did not climb on to the exposed leaves, but only a small number of larvae survived until near the estimated maximum period. In comparison with redworm (trichostrongyle) larvae, the larvae of *Strongylus vulgaris* appear to have a relatively long life.

These observations justify the important suggestion that resting a pasture even for a few weeks may effect considerable reduction in the numbers of its strongyle population.—D. D. OGILVIE.

REFUERZO, P. G., & GARCIA, E. Y. (1938). **The Crustacean Intermediate Hosts of Gnathostoma Spinigerum in the Philippines and its Pre- and Intra-Crustacean Development.**—*Philipp. J. anim. indust.* **5.** 351-362. 5 plates, 1 table.

Ova from a gastric tumour and from the faeces of a dog naturally infected with *Gn.sp.* were cultured in Petri dishes of water at 29°-31°C. Daily examination revealed that the eggs, which are from the first-celled to the multicellular stage, become embryonated in two days. On the fourth day the larvae begin to hatch out, and are immediately infective to the crustacean host. The larvae show a

definite affinity for cyclops, but a water-flea (probably *Moira macrocapa*) appears to be immune. In the body cavity of the former, growth and development occur, culminating in a stage which is infective to the piscine host. The longevity of the crustacean varies directly with the intensity of the infection. The larvae, however, may live for long periods after the death of this host.

In feeding experiments with fish the authors succeeded in producing encysted larvae in one specimen of *Clarias batrachus* and one of *Anabus testudinens*. However, the remote possibility that these fish were previously infected cannot be ignored.—D. D. Ogilvie.

Douglas, J. R. (1938). **A Survey of Canine Thelaziasis in California.**—*J. Amer. vet. med. Ass.* **93.** 382-384. 1 fig., 3 tables. [7 refs.]

A questionnaire sent to 197 veterinarians in California resulted in information concerning 39 cases of canine thelaziasis. In every case it was reported that the dog either lived in or paid frequent visits to wild areas. The life-history of the causative parasite remains obscure, but the observation that most cases of the disease appear in winter and spring may be of moment in elucidating the problem.

Th. californiensis inhabits the lachrymal duct or conjunctival sac, and causes conjunctivitis, excessive lachrymation, scarification of the cornea, and occasionally blindness. The number of worms in the cases reported varied from one to 100, with an average of about 17.

The parasites are widely distributed in California, but *Th.c.* has not yet been reported elsewhere.—D. D. Ogilvie.

Iyer, P. R. K. (1938). **A Form of Verminous Ophthalmia in Equines.**—*Indian J. vet. Sci.* **8.** 3-11. 8 figs. on 2 plates, 1 table. [9 refs.]

An equine periodic ophthalmia in the Punjab, occurring at all seasons, has been attributed to mechanical irritation by dust or flies, to bacteria, or to dietetic deficiency. I. claims to have eliminated these agents as primary factors and to have found that the condition is due to the presence of microfilariae in the cornea and lachrymal glands. Changes observed in the conjunctiva and cornea of affected equines were associated with acute inflammation and the presence of a variable number of microfilariae on histological examination. Similar changes were also observed in the lachrymal glands, and microfilariae were found in sections examined. Concentration of equines in the presence of large numbers of flies appears to be associated with the spread of the disease.

The microfilariae were unsheathed, and are thought to be those of an onchocercoid worm, the adult of which has not yet been found. Antimosan treatment appears to inhibit the disease.—J. A. Griffiths.

IMMUNITY

Colosini, P. (1936). Anti-" esotubercolina " d'origine naturale nel cavallo e nel bue. [**An " Anti-Exotuberculin " Substance Found in Healthy Horses and Cattle**].—*Profilassi.* **9.** 52-55. [6 refs.] [French and German summaries].

Serum from healthy horses, and, in one case, serum from a calf born of a tuberculous cow, was mixed with exotuberculin and injected subcutaneously into cattle reacting positively to exotuberculin alone. In most cases no rise in temperature followed. C. therefore concludes that serum contained a substance capable of preventing the usual temperature reaction to exotuberculin. The proportion of serum to exotuberculin in these experiments was usually about 30:1.

MINSTER, R. D. (1937). **The Advantage of Stained Antigens in the Diagnostic Agglutination Test for Brucella Infections.**—*J. Lab. clin. Med.* **23.** 298-300. [3 refs.]

The addition of 1:40,000 gentian violet and 1:13,000 brilliant green to brucella antigen is recommended for the elimination of pseudo-reactions due to bacterial contamination of blood samples and agglutination tubes. Contaminated sera gave clear-cut results with this stained antigen and not with unstained antigen.

—R. O. MUIR.

CONDREA, P., POENARU, Hélène, & DIMA, G. (1937). Sur la présence des anticorps antitétaniques dans le sérum des chevaux normaux. [**Anti-Tetanic Antibodies in the Serum of Normal Horses**].—*C. R. Soc. Biol. Paris.* **125.** 768-770. [1 ref.]

The sera of 121 normal stallions, mares and geldings of various breeds two months to 23 years old were examined for the presence of tetanus antitoxin, but none was found.

The authors next examined the sera of 40 horses varying in age from 30 days to 23 years for the presence of somatic and flagellar agglutinins to the tetanus bacillus. In foals 30-50 days old, no agglutinins were present. All the other sera had flagellar agglutinins at titres varying from 1:5 to 1:200, except for three samples from young horses. From two years upwards there was no difference in titre due to age. Somatic agglutinins were never found. The absence of flagellar agglutinins from foals and their presence in older animals shows that it is a case of natural acquired immunity, which the authors explain by the intermittent passage of the flagellar antigen through the wall of the alimentary tract.

The absence of antitoxic immunity means that the bacilli do not find in the alimentary tract the conditions favourable to the production of the specific toxin, or that the toxin is modified in the alimentary tract.

PHILIPSON, J. (1937). **Experimental Studies on Enhanced Resistance to Infection Following some Non-Specific Measures.**—*Acta path. microbiol. scand.* Suppl. No. 32. pp. 148. 1 fig., 45 tables, 1 chart. [Numerous refs.] [In English].

This monograph is principally concerned with "promunity" [see next abstract] to Shiga infection as a result of vaccination with paratyphoid B vaccine, and with other questions which arose during the progress of the investigations. It was found that mice immunized with the vaccine and revaccinated two weeks later showed an increased resistance to Shiga infection when tested two hours after revaccination. This resistance is more marked in revaccinated immunized animals than in immunized animals not revaccinated. It was not accompanied by the presence of Shiga agglutinins in the mouse serum, nor was it possible to transfer this resistance passively to normal mice.

A similar enhanced resistance in mice to Shiga infection also arose from injections of rabbit, horse and mouse serum, and this was more marked on injection into previously serum-treated animals than in the case of normal animals.

—GWILYM O. DAVIES.

ØRSKOV, J., & KAUFFMANN, F. (1936). Untersuchungen über die Typhusimmunität der Maus. [**Immunity to Typhus in the Mouse**].—*Z. Hyg. InfektKr.* **119.** 65-71. 6 tables. [10 refs.]

In research on typhoid fever immunity, the authors found that mice infected with W forms of bacilli (O-agglutinable without Vi antigen) developed a transient

immunity against V forms (O-agglutinable with Vi antigen) within a very few days. This phenomenon was quite distinct from the slowly forming and long-lasting immunity following infection with the V forms. They suggest the term " promunity ". " Promunity " is less specific than the ordinary immunity and cannot be transferred passively.—J. E.

BABIĆ, I. (1938). Griješke u umijeću prigodom žaštitnog i ljekovitog cijepljenja domaćih životinja. [**Errors in Preventive and Curative Vaccination of Domestic Animals**].—*Jugoslov. vet. Glasn.* **18.** 425-430. [9 refs.] [German summary].

Accidents after both preventive and curative vaccination of domestic animals are discussed from the forensic standpoint. Questions arising from the responsibility of the maker, the attendant veterinarian, and the owner respectively are discussed.—B. OSWALD (KRIŽEVCI).

REESER, H. E. (1938). Bepaling van bloedgroepen in paardebloed. [**Blood Groups in Horses**].—*Tijdschr. Diergeneesk.* **65.** 115-126. 2 graphs. [English, French and German summaries].

Blood groups were studied in horses by examining 2,500 combinations of sera and blood cells. In 19·4% of the cases, iso-agglutination was observed. The O group was not demonstrated, but the AB group of man was. To prevent confusion it was proposed to call this group in the horse XY. Chemicals must not be added to the sera and blood cells used for such tests, as they influence the result of the reactions. The latter should be observed microscopically.

—JAC. JANSEN (UTRECHT).

ABELL, R. G., & SCHENCK, H. P. (1938). **Microscopic Observations on the Behavior of Living Blood Vessels of the Rabbit during the Reaction of Anaphylaxis.**—*J. Immunol.* **34.** 195-213. 4 figs. [Numerous refs.]

In an attempt to investigate the theory that death in anaphylaxis is due to contraction of the pulmonary arterioles followed by dilatation of the right ventricle, the authors observed the reactions of the blood vessels in the living rabbit's ear, using the transparent moat chamber technique evolved by Abell and Clark [(1932). *Anat. Rec.* **53.** 121].

Intravenous injection or direct introduction of horse serum into the moat in the case of a sensitized rabbit, was followed by contraction to the extent of occlusion of the arterioles, but no contraction of the venules or capillaries occurred. Increased adherence of leucocytes to the vascular endothelium, leucocytic emigration from the venules or capillaries, and clumping of leucocytes causing embolism of the venules and capillaries were also observed, but were not of such regular occurrence. Repeated doses caused extravasation of erythrocytes and actual endothelial destruction. No specific precipitate was visible at any time.—H. V. HUGHES.

DISEASES, GENERAL

MENZIES, D. W. (1938). **Diseases of Sheep in the South-West.**—*Vet. Rec.* **50.** 971-976. [5 refs.]

A consideration of the common bacterial infections of sheep met with in Wiltshire and Dorset. The lesions of lamb dysentery in these counties differ from those of the condition as it occurs in the east of England in that blackish perforated ulcers do not develop in the intestine. Enterotoxaemia occurs in lambs and ewes,

causing a loss of 1-2%. " Swayback " has been observed in lambs and older sheep. Severe outbreaks of omphalophlebitis have been found to be due to a haemolytic streptococcus. Losses from pregnancy toxaemia in some " grass flocks " have amounted to 15%. Contagious pustular dermatitis is also mentioned.—N. J. S.

CATHERINE, A. (1938). L'élevage dans l'extrême-Sud de Madagascar. [**Animal Husbandry in the South of Madagascar**].—*Thesis, Alfort.* pp. 101. 8 figs., 1 map. [Numerous refs.]

C. gives an account of animal husbandry in the extreme south of Madagascar. All classes of livestock are reared, but a limiting factor to improved conditions is the absence of an adequate water supply. In addition to actual losses during periods of drought there is also a resulting lack of resistance to bacterial and other infections. Intensive stocking of the pastures with cattle facilitates the spread of tuberculosis. From the years 1927 to 1936, TB. of the lungs was found in 14·8-19·4% of the carcasses inspected at one of the abattoirs. Losses amongst cattle from anthrax are approximately 3% per annum ; the disease is rarely met with in sheep and pigs. Ringworm occurs in cattle. It is stated that ticks are of less importance in the spread of disease than in other tropical countries. Certain birds play a useful part in keeping the ticks in check. Various forms of mange occur in cattle. At the experimental farm gastro-intestinal strongylosis causes great losses in sheep and goats ; it is stated that sulphur is used as a remedy. Cysticercosis in cattle is rare, but during three years' inspection 4·5-8·3% of pigs were found to be affected.—N. J. SCORGIE.

VALCARENGHI, E. (1936). Nevropatie, paralisi di Marek e coccidiosi aviare. [**Fowl Paralysis and Coccidiosis**].—*Profilassi.* **9.** 97-105. 7 figs. [Numerous refs.] [French and German summaries].

V. describes an outbreak of paralysis on a large Italian poultry farm, where 15% of the fowls, mainly between the ages of 3-5 months, were affected and usually died. He concludes from macroscopic and microscopic examination, and transmission experiments, that it was due to an intense infection with coccidia. Good results are claimed for treatment with thymol, illustrations being given of affected birds before and after cure.

BUTZ, H. (1938). Neuere Ergebnisse der Erbfehlerforschung in der Tierzucht. [**Recent Advances in the Study of Hereditary Defects in Animals**].—*Berl. Münch. tierärztl. Wschr.* November 18th. 703-706.

This is a short review of some of the recent literature dealing with hereditary defects in domestic animals. Among the dominant lethal factors discussed are achondroplasia in Dexter calves, homozygous grey fleece colour in Rumanian sheep, and inability to fly among poultry. Such dominant lethal genes are usually readily detected. Recessive lethal genes are of more importance since they are more common and the heterozygous individuals cannot be distinguished from normal animals. An important example is atresia coli in foals. Other examples are epitheliogenesis imperfecta neonatorum and hypotrichosis cystica in calves. The former condition has also been recorded in the foal. A further recessive lethal factor is responsible for atresia ani in pigs, and this may be accompanied by a lethal factor for " thick leg " in which there is an enormous increase in the connective tissues of the legs.

Other conditions considered hereditary are flat hoof, roaring, cataract, cryptorchidism and inguinal and umbilical hernia in the horse. In the pig, polydactylism syndactylism and cryptorchidism are inherited conditions. It is stressed that

although an isolated example may not be of great interest or importance, cases should be recorded, since the accumulation of evidence may be of value in tracing the conditions observed to a particular locality or to individual parent animals.
—E. G. WHITE.

BÜRGI, O. (1938). Chronische Atembeschwerden und Lungengeschwülste des Pferdes. [**Chronic Respiratory Disorders and Lung Tumours in the Horse**]. —*Festschrift Theodor Schmidt.* pp. 25-32. 3 figs. [Numerous refs.] Berlin and Vienna: Urban & Schwartzenberg.

B. stresses the importance of a primary bronchitis in the production of chronic vesicular emphysema, and discusses some unpublished work which explains the localization of the emphysematous changes in the horse on the basis of a sparsity of elastic fibres in the pleura over these areas.

Chronic respiratory distress in the horse may also be due to neoplasia of the lungs, and a case of primary adenocarcinoma and one of secondary sarcoma are described. The former is of special interest since both lungs were affected with multiple neoplasms, the epithelium lining their acini being similar to bronchial epithelium.—E. G. WHITE.

M'FADYEAN, J. (1938). **Equine Contagious Pneumonia. German** *Brustseuche.* —*J. comp. Path.* **51.** 108-118. 1 text fig., 6 figs. on 3 plates. [5 refs.]

This paper is largely a review of the German work carried out on "Brustseuche", commencing with that of SCHÜTZ, published in 1887, and culminating in that of GAFFKY and LÜHRS (1913) who showed the primary cause of the disease to be a filtrable virus. In addition, three cases are described illustrating the pneumonic changes of "Brustseuche" which are due to streptococci. The autopsies were carried out on animals which died at the Royal Veterinary College, London, in 1903, 1906 and 1916. The lesions consisted of a broncho-pneumonia with a marked tendency to necrosis and gangrene and a secondary pleurisy with effusion.—E. G. WHITE.

MARSH, H. (1938). **Pneumonia in Rocky Mountain Bighorn Sheep.**—*J. Mammal.* **19.** 214-219.

A description is given of the incidence, symptoms and pathology of two distinct diseases which have caused considerable loss from time to time during the last 13 years among herds of Rocky Mountain Bighorn sheep.

The more prevalent disease was a subacute or chronic broncho-pneumonia of adult sheep, apparently caused by a lungworm, *Protostrongylus stilesi*, with secondary bacterial invasion by *Corynebact. pyogenes* and a species of *Pasteurella.* The heavy infestation by parasites is considered to be due to the lack of proper winter ranges, with consequent overgrazing and overcrowding of autumn and spring ranges.

The second disease described is an acute bacterial pneumonia of lambs 2-3 months old. Bacterial and histological work was carried out in only two cases, and in these a *Pasteurella* appeared responsible for the condition, with *Corynebact. pyogenes* as a secondary invader.—F. J. ANDREWS.

I. NUNGESTER, W. J., & JOURDONAIS, L. F. (1936). **Mucin as an Aid in the Experimental Production of Lobar Pneumonia.**—*J. infect. Dis.* **59.** 258-265. 1 table. [19 refs.]

II. ROBERTSON, O. H. (1938). **Recent Studies on Experimental Lobar Pneu-**

monia. Pathogenesis, Recovery and Immunity.—*J. Amer. med. Ass.* **111.** 1432-1437. 3 figs. [Numerous refs.]

III. Robertson, O. H., & Fox, J. P. (1939). **The Relationship of Infecting Dosage, Leucocytic Response, Bacteremia, and Extent of Pulmonary Involvement to the Outcome of Experimental Lobar Pneumonia in the Dog.**—*J. exp. Med.* **69.** 229-246. 9 tables. [8 refs.]

I. The objects of these experiments, like those of certain other workers, was to throw some further light on the aetiology of lobar pneumonia in human beings, in particular on the reason why normal individuals may harbour virulent pneumococci in the upper respiratory tract and not contract pneumonia, and to explain the mechanism by which such predisposing factors as exposure to cold, dust or fatigue lower the resistance of the host.

The authors' work was concerned with attempts to set up lobar pneumonia in white rats, taken from a source known to be free from spontaneous pneumonia, by the intrabronchial injection of small doses of pneumococci (Type III). A small brass canula was passed into the trachea, soap solution then being smeared over the proximal end in order that the formation of soap bubbles might indicate that the canula was actually in the trachea. A small ureteral catheter was then passed through the canula until resistance was met, withdrawn 3-4 mm., and the injection made. Some 200 experimental animals were used as well as a number of controls.

It was found that the suspension of the injecting dose in small amounts of sterile mucin (viscosity adjusted to 5, equivalent to a 5-8% solution) aided greatly in the production of lobar pneumonia in the rat. As few as 100 bacteria when inoculated in 0·1 c.c. mucin produced what is described as lobar pneumonia in 50% of inoculated animals. By increasing the dose 10-100 times, the incidence of pneumonia was increased to 84% (86 animals). When similar doses were injected in saline, the incidence of pneumonia was markedly lower. Consolidation varied in extent, but with doses of 0·1 c.c. of 10^{-5} usually involved nearly all of the injected lobe. The different stages of the pneumonia produced in the rat are regarded as similar to those in human beings and a histological report is to follow. In rats the temperature quickly became sub-normal after an initial rise. Mucin alone in 0·1 c.c. dose caused little disturbance, but larger inocula of this or of saline were found to be contra-indicated.

The authors support the view that the mucin acts by protecting the bacteria and that this may in part explain the action of cold, dust, etc., in the development of lobar pneumonia in the human subject, since an outpouring of mucin is a result of such agencies.

II. In this article the previous observations of the author and his co-workers on experimental pneumonia in the dog are summarized and discussed, together with the findings of others in work of a similar nature. Most of the outstanding results have already been abstracted [*V. B.* **9.** 258.] with the exception of those relating to immunity which may be briefly summarized here.

The mechanism of recovery appears to be a dual one: firstly, a generalized process consisting of (1) the pneumococcus-killing power of the blood and (2) what is called the lung-blood barrier, which even in the absence of (1) may be sufficient to prevent bacteraemia; and, secondly, the macrophage activity. If either fails, death ensues.

One attack of experimental pneumonia confers an increased resistance for many months; this resistance seems to lie in accelerated macrophage activity which occurs when injection is again attempted. Against very large doses it was, however, only effective for a short period, correlated with the demonstrable presence

of macrophages, and confined to the previously affected area. Repeated injections were followed by a greater degree of resistance.

III. The authors describe further experiments on some hundreds of dogs in which they have studied the influence of various factors on the course and outcome of the intrabronchial injection with Type I pneumococci suspended in starch broth by the method described in 1933 [*V. B.* **9.** 258].

Injecting doses of 0·001 c.c. or less of culture produced few lesions and no deaths, and doses of 0·01 to 0·03 c.c. a mortality of 8%, but with larger amounts of culture the average extent of the lesions increased to half of the total lung field (X-ray pictures; confirmed by autopsy when death occurred) and the mortality to over 60%. Increase of the volume of the starch suspension itself from the usual 1 c.c. to 6 c.c. also produced double the pulmonary involvement and increased the mortality eight times, a result attributed to the larger number of alveoli initially involved. At 24 hours after injection, the white cell count proved the best index of the probable outcome, the mortality increasing with diminishing numbers of circulating white cells then present. Animals with less than 2,000 per c.mm. usually died and those with 20,000 per c.mm. nearly always recovered. The extent of pulmonary involvement also bore a direct relation to the death rate. When the lesion was confined to one lobe the death rate was about 1%. Involvement of other lobes was accompanied by a sharply rising mortality which reached 98% in dogs with three-fourths of the total lung field involved. Increasing occurrence of bacteraemia also in general ran parallel with decreasing white cell counts and increasing lung involvement. After the 24 hour stage it was the best index of the final outcome. Provided bacteraemia did not occur, the animal often recovered, although leucopenia was marked and pulmonary involvement was extensive, but, when bacteria occurred together with a count of 5,000 or less, or involvement of one half or more of the total lung field, death nearly always resulted. The relationship of these findings to those in human lobar pneumonia are briefly discussed.

—A. W. Stableforth.

Datta, S. C. A. (1938). **Chronic Bovine Haematuria.**—*Rep. 1st. Imp. vet. Conf. Lond. 1938.* pp. 78-79. Discussion pp. 79-81. Weybridge: Imperial Bureau of Animal Health. [5s.]

D. described his investigations in India and showed photomicrographs of an aspergillus, which was invariably found in intimate association with the disease, and which had been demonstrated in jugular blood and kidney and bladder tissue from natural cases. Strains of the fungus from different localities were alike in their morphological and staining characters, cultural requirements and biological behaviour, and were highly pathogenic to rabbits and other animals, affecting primarily the urinary system. Transmission experiments were carried out on healthy bulls by the prolonged administration of morbid material, and various degrees of bladder infection were set up in three adults, varying from the development of well established patchy congestion or rounded oedematous nodular growths to papillomata with minute ulcers. Haematuria was produced in a calf in three months by oral administration of urinary sediment from clinical cases, and the fungus was recovered in pure culture from this and the other cases. It differed from any of the described species, but seemed to belong to the *Aspergillus glaucus* group and fulfilled the criteria of pathogenic aspergilli. In an adult bull which died within a month of receiving a massive dose of the aspergillus intravenously in pure culture, characteristic lesions were produced in the viscera. Histological examination showed characteristic aspergillar heads projecting into the lumen of the blood vessels, with the consequent bursting of the vessel wall,

but in a much more pronounced form than in naturally infected animals. In D's opinion, the constancy of the results described was an indication that the disease was due to the organism described.

Dr WATSON described the conditions in Canada, where the infection is found only in British Columbia, principally in the delta of the Frazer River [see *V. B.* **8.** 41.], occurring year after year on some farms, while on others it tended to die out as the land was brought under close and continuous cultivation. Some farms near those affected were never affected. On one farm the young bulls became affected in early life, but over a long period of years the cows were not affected. When affected cows were removed from the district and put on unaffected farms they seldom recovered, but no fresh cases developed. In 25 years of study in Canada, thousands of specimens of blood, urinary sediments, bladder lesions and kidney sections had been examined for bacteria, protozoa and parasites. The aspergillus described by D. had not been observed.

Dr HOPKIRK said that the disease occurred in New Zealand, but disappeared as soon as the bush was cleared.

Mr DAUBNEY said that in Kenya there were two main areas of infection, in both of which tea was grown. On one farm, nearly all cows a few years ago were liable to contract the disease, mostly at parturition, but with the improvement of the stock and paddocks and the clearing of the bush and bracken the disease had died out, and there had been no cases for seven years. He suggested that the fungus described might be parasitic on some plants found only on poor pasture. He also pointed out that in the later stages of the disease the urethra was patent and that the organism described might thus gain an entrance.

Other speakers mentioned the danger of confusing haematuria and haemoglobinuria, and the possibility that the disease might be transmitted at service.

POMMERET, M. (1937). Entamoeba kamala et l'hématurie essentielle des bovidés. [*E.k.* **as the Cause of Bovine Haematuria**].—*Thesis, Alfort.* pp. 63. 13 figs. [Numerous refs.]

This thesis consists chiefly of a general description of chronic bovine haematuria with particular attention to the work of DATTA [*V. B.* **6.** 66]. P. examined the urine and bladder of French cows affected with haematuria, but failed to observe amoebae in microscopic preparations or to isolate amoebae in culture. [DATTA has since described a species of *Aspergillus* in lesions, and has suggested that this is the cause—see previous abstract].—J. E.

GUENTHER, D. F. (1937). Beitrag zum Studium der verschiedenen Formen der Hämoglobinurie. [**The Various Forms of Haemoglobinuria**].—*Tierärztl. Rdsch.* **43.** 586-588. [11 refs.]

A general article without fresh protocols, dealing with haemoglobinuria associated with haemolysins, methaemoglobinuria of toxic origin, haemoglobinaemia paralytica, and haemoglobinuria in piroplasmoses and other diseases.—H. H. G.

BRION, A. (1937). Sur la pathogénie de la myoglobinurie. [**Pathogenesis of Myoglobinuria**].—*Rev. Méd. vét., Toulouse.* **89.** 505-525. 2 tables. [Numerous refs.]

A general review of present knowledge on the pathogenesis of equine myoglobinuria, in which the histology and biochemistry of affected muscles are described in relation to function and to clinical symptoms of the disorder. A section on the functioning of healthy muscle is followed by one on muscle metabolism in myoglobinuria. The parts played by reserve glycogen and by lactic acid [*V. B.* **1.**

234.], by the phosphorus compounds of muscle and by blood glucose are discussed, and an explanation is offered for the disturbed oxidative processes. Arrested glycolysis in this disorder is compared with that of muscle experimentally poisoned with iodo-acetic acid. Insulin supply appears to play no part. The physical state of muscle fibres following colloidal imbibition by muscle proteins on alteration of pH under conditions of disturbed muscular metabolism explains the clinical symptoms.—H. H. Green.

Palmer, C. C. (1938). **Pyelonephritis in Cattle.**—*J. Amer. vet. med. Ass.* **93.** 241-243. 1 table. [7 refs.]

P. observed the course of pyelonephritis in three herds. The spread of the disease was very slow, and its course in an affected animal lasted months, clinical symptoms not becoming obvious until the lesions were pronounced. One case is described in detail, a Gram-positive diphtheroid and *Eberthella pyogenes* [Bergey] being isolated.—S. F. Barnett.

Guillou, J. (1938). Sur un état hémorragipare des jeunes bovins du Finistère. [**A Purpuric Disease of Young Cattle in Finistère**].—*Thesis, Alfort.* pp. 56. [18 refs.]

G. describes a purpuric disease attacking cattle 3-18 months old, which appears to be peculiar to Brittany. The disease occurs in enzootic form only during the warm months of the year, and is almost always fatal. It is characterized by high fever, snoring, and nasal, anal, and subcutaneous haemorrhage, the latter being the pathognomonic symptom. The P.M. lesions resemble those of haemorrhagic septicaemia, but in no case did cultures reveal the presence of *Pasteurella boviseptica.* It is stated that experiments excluded the possibility that bracken poisoning is a cause. Control is said to consist of the separation of healthy and affected animals, the former being kept out of the stable night and day, and the maintenance of the affected ones indoors, so that they can be properly cared for. It is advocated that a prophylactic inoculation of 150-200 c.c. of citrated blood from adult animals should be given.—N. J. Scorgie.

Tunis, E. (1936). Contributo clinico-terapeutico sulla encefalomielite infettiva dei bovini. [**Infectious Encephalomyelitis in Cattle**].—*Profilassi.* **9.** 190-191. [French summary].

T. describes three cases of what is described as enzootic encephalomyelitis in Sardinia.

Carpano, M. (1938). Oftalmite contagiosa dei bovini. [**Contagious Ophthalmia in Cattle**].—*Azione vet.* **7.** 624-626.

C. describes an outbreak of contagious ophthalmia in cattle in Albania, and asserts that it is little known in Europe, though known in North America, parts of Africa and elsewhere. He insists on the contagious nature of the disease, though admitting that sun-glare, dust, and flies may be predisposing causes. He implies that it is due to a virus. He gives details of the symptoms and general course of the disease, which varies between conjunctivitis and panophthalmia, and may lead to blindness.

He insists on the necessity for isolation of infected cases, and says this should be continued for 20 days after the disappearance of the symptoms.—S. F. J. H.

Cirenei, G. (1938). Lesioni anatomo-patologiche renali da compressione poco communi in animali da macello. [**Unusual Renal Lesions in Slaughter Animals**].—*Clin. vet., Milano.* **61.** 494-496. 9 figs. on 2 plates.

C. reports in detail two cases of unusual renal lesions in animals brought to

an abattoir. In a pig, there was a large renal capsule cyst in the left kidney, and in a calf about two months old half of the tissue of one kidney was in the form of a multilocular, hydronephrotic sac, the size of a child's head.—S. F. J. HODGMAN.

—. (1938). **Facial Eczema in Sheep and Cattle. Prevention by Farm Management.**—*N. Z. J. Agric.* **57.** 538.

A Facial Eczema Management Committee, composed of officers of the Departments of Agriculture and Scientific and Industrial Research, and representatives of farmers' interests, was set up in April, 1938, to consider the recent severe outbreak of facial eczema (photosensitivity) in New Zealand and make proposals for the investigation and prevention of the disease. The committee summarizes a general plan of prevention and considers that as facial eczema is apparently caused by a quick flush of grass in warm and humid weather following a period of drought, stock should be kept off rapidly-growing grass in the autumn for several weeks. They urge that, in order to ensure that this practice may be followed, farmers should build up reserves of hay and silage and maintain a portion of their farm in mature grass, which can be grazed when a flush growth is taking place on hard grazed paddocks.—L. W. N. FITCH.

FRASER, A. C. (1938). **Heel-Bug in the Thoroughbred Horse.**—*Vet. Rec.* **50.** 1455-1457. [3 refs.] Discussion pp. 1457-1459.

The importance, nature and effects of the disease are described, and it is suggested that the harvest-bug *Trombicula autumnalis* is the cause of the condition, but no investigation was carried out. The habits and life-history are discussed. Methods of treatment, both curative and prophylactic, are described, with notes on the differentiation of the disease from the more commonly occurring lesions in the heels of horses.

A short discussion followed, during which one speaker suggested the larvae of *Strongyloides* worms might be a cause of the condition.—F. J. ANDREWS.

I. PASSEY, R. D. (1935). **Experimental Carcinogenesis.**—*Rep. Brit. Emp. Cancer Campaign, York. Coun. 1934-1935.* pp. 8-10.

II. CRAMER, W. (1937). **Papillomatosis in the Forestomach of the Rat and its Bearing on the Work of Fibiger.**—*Amer. J. Cancer.* **31.** 537-555. 20 figs. [9 refs.]

III. ANON. (1938). **Fibiger's Tumour of the Rat's Stomach.**—*Lancet.* **234.** 735-736. [6 refs.]

I. The author reports that he was unable to produce neoplasia of the stomach in rats by infestation with *Gongylonema neoplasticum*, though he set up a heavy infestation of the oesophagus and stomach and kept his rats under observation for 500 days, a period much longer than in the case of FIBIGER's work [see also III, below]. He considers that the neoplasia in FIBIGER's rats was not aetiologically related to the worm.

II. C. carried out two series of experiments on rats, in 1927 and 1937, in order to find whether gastric papilloma could be induced in the forestomach of rats on a deficient diet, as had been claimed by FUJIMAKI [(1926). *J. Cancer Res.* **10.** 469].

In 1927, large benign hyperkeratotic papillomata were produced in many rats on a diet deficient in vitamin A, and in a few rats on a vitamin B-deficient diet. The precise causal connexion between the tumour and the diet was not determined.

An attempt to induce similar gastric tumours in rats in 1937 by the same means was without success.

III. An annotation discussing the possibility that malignant neoplasms might be induced by a parasite, as claimed by FIBIGER [(1913, 1914 and 1920). *Z. Krebsforsch.* **13.** 217; **14.** 295, and **17.** 1]. Later work has failed to support this view, as some workers have failed to induce neoplasia with *G.n.* and others have induced neoplasia by dietetic means [see I and II, above].—J. E.

WILLIAMS, J. K., GILDOW, E. M., & LAMPMAN, C. E. (1938). **Some Factors Influencing the Transmission of Fowl Paralysis.**—*U.S. Egg & Poultry Magazine.* Jan. 1938. p. 24. 1 table.

The authors state that F.P. is transmitted by contact and that up to 40% of pullets from susceptible flocks became affected when placed with affected chicks. Chicks from such flocks are stated to be less susceptible to F.P. after the first six weeks of life. Chicks from paralysis-affected stock are more resistant than those from paralysis-free stock, and those bred from pullets are more susceptible than those bred from two-year-old hens. There was found to be a marked difference in resistance to the disease in the progeny of certain matings, and the authors consider that by careful selection the incidence of fowl paralysis may be materially reduced.—J. E. WILSON.

I. ENGELBRETH-HOLM, J., & FREDERIKSEN, O. (1938). **The Reactivation of the Fowl Leukosis Agent after Inactivation by Oxidization.**—*Acta Path. microbiol. scand.* Suppl. No. 37. pp. 138-144. 3 tables. [7 refs.] [In English].

II. ENGELBRETH-HOLM, J., & FREDERIKSEN, O. (1938). **The Transmission of Mouse Leucaemia to Healthy Animals by Means of Cell-Free Substance.**—*Ibid.* pp. 145-154. 5 figs., 3 tables. [4 refs.] [In English].

I. In these experiments re-centrifuged leucotic chicken plasma from a mixed haemocytoblastosis-sarcoma strain was used. It was found possible to inactivate the fowl leucosis agent by oxidation. Reactivation by reduction could be demonstrated with a cystein-cobalt sulphate system provided that oxidation had not been complete. Such reactivation could restore the agent to almost full potency.

II. An attempt was made to transfer mouse leucaemia by the supernatant fluid of centrifuged lymph node material. The fluid was prepared from diseased mice killed by potassium ferricyanide, and the handling of the material was done under anaerobic conditions. After reduction with cobalt-cysteine, injections were made into mice. Thirty-six of 159 animals injected developed typical disease. Since control tests showed that the inoculum was cell-free, and the possibility of spontaneous origin was eliminated, it was concluded that lymphatic leucaemia had been transferred to healthy animals without the assistance of intact cells.—D. D. O.

SEVERGNINI, A. (1936). Un caso di leucemia linfoadenoide in un cavallo. [**Lymphadenoid Leucaemia in a Horse**].—*Profilassi.* **9.** 147-149.

S. describes a case of lymphatic leucaemia in an undernourished, overworked and badly kept horse. The appearance of the blood, lymph nodes, bone-marrow, spleen, liver, intestines, lungs and heart is described.

VON GAJEWSKI, S. R. (1938). Klinische Bemerkungen zu Lymphdrüsengeschwülsten. [**Clinical Observations on Lymph Node Tumours**].—*Festschrift Theodor Schmidt.* pp. 47-52. Berlin and Vienna: Urban & Schwarzenberg.

Basing his remarks on malignant tumours in dogs, G. discusses the clinical features of secondary carcinoma, involving lymph nodes draining the site of the primary tumour, including inflammatory changes due to ulceration of the primary growth. Early operative removal of affected lymph nodes together with as much

as possible of the surrounding fat and connective tissue is the most satisfactory treatment ; irradiation may be used in addition. The prognosis in cases of lymphosarcomatosis affecting lymph nodes is very unfavourable, and operative treatment is unlikely to be of any use. It is possible, however, that these tumours may be radiosensitive, as is the case in man.—E. G. WHITE.

CHAMPY, C., & LAVEDAN, J. P. (1938). Production de tumeurs par régénération entretenue dans les testicules des oiseaux. [**Tumours in the Testicles of Birds Caused by Regeneration**].—*C. R. Acad. Sci., Paris.* **207.** 99-100. [1 ref.]

If birds are castrated so that a small part of the testicle remains, an active process of regeneration sets in. In many cases normal semeniferous tubules are produced, but in some birds neoplastic growth occurs.

The authors kept 15 birds on which this partial castration had been performed, for three years after the operation ; four of them developed tumours the size of a man's fist, filling the abdominal cavity and killing the bird ; metastasis occurred. These tumours are described as malignant seminomata, arising from abnormal regenerative growth.

The authors suggest that the special interest of these tumours lies in the fact that by observing them, new light might be thrown on the disorganization of the growth factors of the seminal tissue, particularly in the case of the pituitary.

MENSA, A. (1938). Ueber die odontogenon Tumoren der Kiefer. Ein mandibuläres Lymphozystom bei einem Pferde. [**Odontogenous Tumours of the Jaws : Mandibular Lymphocystoma in a Horse**].—*Festschrift Theodor Schmidt.* pp. 110-122. 15 figs. [Numerous refs.] Berlin and Vienna : Urban & Schwarzenberg.

A review of the literature dealing with odontogenous tumours in animals is followed by a detailed description of a very unusual tumour, the size of a man's head, arising from the horizontal ramus of the mandible in a seven-year-old horse. At autopsy, the tumour was found to be composed of multilocular cysts, some of which contained pus, probably the result of previous exploratory puncture, whilst others were lined by a thin membrane. Histologically, the cyst walls were composed of bony and osteoid trabeculae, and lined by myxomatous connective tissue. In the region of the premolar and molar teeth, there was a considerable amount of compact bone, resembling cement. Finally, in the mucoid connective tissue there were numerous lymph spaces lined by a single layer of endothelium. In view of these features, the tumour was classed as a mandibular lymphocystoma, analogous to haemangiomatous tumours in this site, of which there are several records in veterinary pathology.—E. G. WHITE.

FORSTER, H. (1937). Zur Bakteriologie und Serologie des Tumorkokkus polymorphus haemolyticus. [**Bacteriology and Serology of** *Tumorcoccus polymorphus haemolyticus*).—*Münch. tierärztl. Wschr.* **88.** 445-448 and 459-461.

This is an uncritical discussion of the literature on bacillary bodies present in various " tumours ". A number of authors are mentioned, but no references are given. F. examined 26 tumours in all, 17 of which were from human and 9 from animal sources. He divides the specimens into 5 groups :– six specimens of papilloma, 12 of carcinoma, 3 of myoma, 4 of sarcoma and one " Ehrlich sarcoma ". A coccus was isolated from all cases and was found to be similar morphologically, culturally, biochemically and serologically. The only difference was in pathogenicity, as most strains failed to affect laboratory animals ; some

caused death, but not from tumour formation. [These deaths were probably caused by toxic elements present in the cultures injected, as large doses were administered and filtrates also killed. It is unfortunate that no attempts were made to infect animals similar to those from which the tumours originated.] F. refrains from drawing any conclusions as to the aetiology of the tumour conditions.

—P. S. Watts.

Bonnet, C. (1938). Considérations sur quelques lésions granulaires. [**Aetiology of Granular Lesions in Animals**].—*Thesis, Lyons.* pp. 101. [Numerous refs.]

This is a consideration of the literature dealing with certain local tissue reactions, having some general macroscopic similarity to true tubercular lesions, as found in glanders, various strepto-bacillary infections of cattle, parasitic infestations of lungs and liver, aspergillosis, actinobacillosis, and foreign body reactions.

—N. J. Scorgie.

NUTRITION IN RELATION TO DISEASE

Miller, W. C. (1938). **Some Aspects of Feeding in Relation to Livestock Disease.** —*Vet. Rec.* **50.** 1042-1050. [10 refs.]

At the outset, reference is made to the tendency to systemic upset consequent upon selective breeding of animals for increased production or performance, and to the markedly beneficial effects of adequate exercise upon such animals.

Colic, myoglobinuria, non-specific lymphangitis, urticaria, and some forms of sterility are regarded as diseases which follow overfeeding with balanced foods, especially in the absence of exercise.

Unbalanced rations can be particularly harmful. Gross excess of fat or deficiency of carbohydrate leads to ketonaemia, acetonaemia, and consequently acidosis. Excess of certain proteins will cause an almost identical condition in cows and sheep. Constant excess of protein may also cause intoxication if the detoxicating mechanism fails to function adequately. In M.'s opinion protein overfeeding is general in Great Britain.

Underfeeding leads *inter alia* to rickets, mineral deficiencies, avitaminoses, and higher mortality in parasitic diseases. The indiscriminate use of " balanced " cakes of secret composition is deprecated, and a greater use of sound home-grown material is advocated. The essential importance of freshness of food is stressed, serious deterioration in food value occurring rapidly during storage of all cereal by-products and high-protein foods. Hay is particularly variable in its food value, and in this respect appearances are often deceptive.—D. D. Ogilvie.

Eveleth, D. F., & Biester, H. E. (1938). **Blood Chemistry in the Study of Nutritional Diseases of Swine.**—*J. Amer. vet. med. Ass.* **93.** 249-254. 4 tables. [12 refs.]

Four groups of pigs were reared on rations containing various proportions of yellow maize and skim milk powder, with chalk, salt, and free access to soil. Low protein groups failed to make adequate growth. The ration was thought to contain no vitamin C [there is no evidence submitted to support this] and analysis showed that the pigs had plasma ascorbic acid contents of the same order as those which had been injected with 1 g. ascorbic acid three days previously. This, in conjunction with the absence of typical lesions of scurvy, is taken to show that pigs have the power to synthesize this vitamin. The pigs were killed off at periods of 118-278 days, and samples of serum and whole blood were collected at death. On the basis of this single blood analysis it is concluded that a tendency to low serum Ca and

protein values is found in pigs on rations low in these substances : the inorganic P figures obtained are thought to indicate a sub-optimal P intake ; an absence of nutritional oedema with low serum protein is recorded.

[The reliability of these conclusions, based on a single series of analyses at death, is very much open to question. It is difficult to understand why systematic blood analyses were not conducted throughout the course of the experiment. In the abstractor's opinion, the value of the experiment is practically negligible and the paper provides a further example of certain conclusions getting into the literature based on very meagre and doubtful experimental evidence].—ALFRED EDEN.

SVANBERG, O. (1937). Beskrivning av treåriga försök till bekämpande av bristsjukdomar hos boskapen i allmogebesättningar på Gotland. **[Report of Three Years' Experience in the Fight against Deficiency Diseases in Cattle on the Island of Gothland]**.—*K. Landtbr Akad. Handl., Stockh.* **76.** 354-394. [English summary].

The soil and vegetation of Gothland are characterized by great richness in lime and marked deficiency in phosphoric acid. The symptoms in cattle attributable to deficiency in phosphoric acid on the island are general inanition with depraved appetite, sexual disturbances, difficulties in the rearing of young animals, and wide-spread osteomalacia, the latter being particularly prevalent in dry seasons. Control measures that have proved effective include the application of superphosphate to the soil, the early harvesting of feed crops (since the phosphoric acid content of plants quickly decrease during the ripening period), the use of roots or other succulent crops as a supplement to hay, the administration of 50-60 g. sodium phosphate per day, and the selection of cattle which are resistant to this disease. Sheep rearing is generally a complete failure in affected areas. As regards horse breeding, it would appear that the phosphorus requirements of horses are lower than those of cattle and sheep, but since the soil of lime-rich districts produces a vegetation very deficient in manganese, anaemic conditions in horses are very common [see also *V. B.* **6.** 127].—N. J. SCORGIE.

DUNLOP, G., & WELLS, H. E. (1938). **" Warfa " (" Swayback ") in Lambs in North Derbyshire and its Prevention by adding Copper Supplements to the Diet of the Ewes during Gestation.**—*Vet. Rec.* **50.** 1175-1182. 1 table, 1 map, 1 appendix. [5 refs.]

" Warfa " or " swayback " affects lambs in a specified area of some 38 square miles in North Derbyshire, leading to a mortality of up to 100%. All breeds of sheep are susceptible, and lambs from ewes of any age may be affected. The incidence varies from season to season, being reduced following a hard winter when concentrates have to be fed to ewes. The disease is not hereditary, nor can lead intoxication be regarded as the aetiological factor. Suspicion that a nutritional factor might be involved led to the feeding of salt licks, containing 0·3% each of Co, Cu, Mn and B, and of each (except B) separately, to ewes on some 33 farms within the area. These ewes were allowed access to the licks at such a level that they received about 1½ lb. of the minerals per head during the gestation period, or about 10 mg. per day. Comparison with untreated controls and with the incidence over the three preceding years showed that the offspring of those ewes which had received Cu supplements had a greatly reduced incidence of the disease (less than 2% compared with 15% in the control groups) whereas Co and Mn were without apparent effect. The suggestion of BENNETTS and CHAPMAN [*V. B.* **8.** 654.] that Cu is an aetiological factor in the incidence of enzootic ataxia (swayback) thus receives some striking confirmation.—A. EDEN.

FORBES, E. B., & JOHNSON, S. R. (1937). **Phosphorus Deficiency in Cattle as a Result of Conditions Other than Low Phosphorous Content of the Soil and of the Feeding Stuffs Grown Thereon.**—*Proc. Amer. Soc. Anim. Prod. 1937.* pp. 340-344. 1 table.

An informal inquiry into the possibility of P deficiency in cattle in parts of Pennsylvania where the soil P is low, showed that P deficiency occurs only occasionally in cattle in these areas (as a result of improper farm practices), and only incidentally and to a very minor degree as a consequence of the low P content of the soil, in so far as it affects the vegetation. The condition may be seen in milking cows improperly fed, and is relieved by supplementary feeding with bone-meal.
—ALFRED EDEN.

CUNNINGHAM, I. J., & CUNNINGHAM, Marion M. (1938). **Dietary Magnesium and Urinary Calculi.**—*N. Z. J. Sci. Tech.* **19.** 529-535. 3 tables. [11 refs.]

The authors describe the formation of bladder calculi in rats, due to the ingestion of diets high in calcium carbonate but low in magnesium. The calculi consisted mainly of calcium hydroxide with small amounts of calcium carbonate deposited in an organic matrix, which constituted about 50% by weight of the calculus.

Addition of magnesium to the rations prevented the formation of calculi, despite the presence of excess calcium carbonate. Addition of phosphate to the ration also prevented calculus formation, by preventing excessive absorption of calcium.

It is pointed out that a high serum calcium was one factor necessary for production of the calculi, and that this high serum calcium was associated with high urinary excretion of calcium and an alkaline urine. When high serum calcium was associated with low serum magnesium, calculus formation took place. The hypothesis is advanced that the minor deficiency of magnesium caused slight kidney damage, thus providing nuclei for calculi formation, and that small deposits formed on such nuclei were transported to the bladder, where growth by concretion occurred.—L. W. N. FITCH.

MOORE, L. A., HALLMAN, E. T., & SHOLL, L. B. (1938). **Cardiovascular and other Lesions in Calves Fed Diets Low in Magnesium.**—*Arch. Path.* **26.** 820-838. 7 figs. [Numerous refs.]

The experimental calves of DUNCAN, HUFFMAN and ROBINSON [*V. B.* **5.** 667.] and of HUFFMAN and DUNCAN [*V. B.* **9.** 37.] reared on rations low in Mg so that ultimately the blood Mg was reduced to a low level, showed P.M. a definite pathological picture. Microscopical and macroscopical lesions were in evidence in the aorta and large arteries, endocardium and jugular vein, on the surface of the diaphragm, and in the trabeculae and capsule of the spleen, characterized principally by a deposition of Ca salts in the yellow elastic fibres. There was also some degeneration and calcification of the Purkinje fibres of the heart as well as various degrees of hepatitis and nephritis. A possible connexion between low dietary Mg and arteriosclerosis in man is suggested, and the attention of medical workers is directed to such a possibility.—ALFRED EDEN.

ASKEW, H. O. (1938). **The Value of Cobalt Supplements for Breeding-Ewes at Sherry River, Nelson.**—*N. Z. J. Sci. Tech.* **20.** 192A-196A. 3 figs., 2 tables.

An ailment diagnosed as " bush sickness ", occurring on granite derived soils in the Sherry River, was found to be preventable in breeding-ewes by the administration of a cobaltized stock lick. The animals received approximately 9 mg. of cobalt per head weekly.—L. W. N. FITCH.

SEEKLES, L. (1937). De interne secretie bij paresis puerperalis van het rund. [**Internal Secretion in Milk Fever**].—*Tijdschr. Diergeneesk.* **64.** 866-872. [Numerous refs.]

The biochemical blood picture in milk fever is considered in relation to recent advances in knowledge of internal secretions and to SJOLLEMA's view (1927) that the disorder can be characterized as a syndrome associated with temporary functional disturbance of the sympathetic nervous system and endocrine organs. Evidence is adduced in favour of the view that hyperfunction of the anterior pituitary is as likely as the hypofunction of the parathyroids earlier suggested by DRYERRE and GREIG [(1925). *Vet. Rec.* **5.** 225]. Injection of the thyrotropic hormone of the anterior lobe of the hypophysis into g. pigs may, as shown by EGGS [(1934). *Dtsch. Z. Chir.* **242.** 321.], cause a fall in serum calcium, while the gonadotropic hormone, according to CANNAVÓ [(1932). *Biochem. Z.* **245.** 234.], causes a rise in serum magnesium in man, dog and rabbit. Hormones of the anterior pituitary are also known to affect metabolism of carbohydrate and fat, and variations in functional activity may explain the variations in blood sugar and rise in acetone often noted in milk fever. Possibly increased production of the lactogenic hormone in milk fever is discussed. Increased pituitary activity is known to occur in late pregnancy and at parturition, and the syndrome of milk fever may arise from a lack of balance between the various hormones secreted.—H. H. GREEN.

SNOOK, L. C., & GODDEN, W. (1938). **The Sugar and Total Ketone Content of the Blood of Ewes and of their New-Born Lambs.**—*Biochem. J.* **32.** 2037-2039. 1 table. [6 refs.]

The sugar and total ketones in the blood of five normal and eight ketonaemic ewes prior to and shortly after lambing are recorded together with the corresponding figures for the blood of the lambs, drawn shortly after birth. The data show that a marked rise in the blood sugar levels of both normal and hypoglycaemic ewes occurred at parturition, although the rise was not so great in the hypoglycaemic animals. The blood of the new-born lamb contained a higher percentage of sugar than that of its dam bled at the same time, but the difference was less pronounced in the lambs from hypoglycaemic ewes than in the case of healthy ewes and their progeny. There was a complete absence of ketone bodies from the blood of the new-born lambs from ewes showing signs of severe ketonaemia.—R. ALLCROFT.

I. FOOT, A. S., GOLDING, J., KON, S. K., CAMPION, J., HENRY, K. M., & HUTHNANCE, S. L. (1938). **The Vitamin Requirements of Pigs with Special Reference to Vitamin A and to Certain Components of the Vitamin B Complex.** pp. 68. 28 figs., 10 plates, 22 tables. [Numerous refs.] Reading: National Institute for Research in Dairying. [4to] [1s. 6d.]

II. HUGHES, E. H. (1938). **The Vitamin-B Complex as Related to Growth and Metabolism in the Pig.**—*Hilgardia.* **11.** 595-612. 5 figs., 3 tables. [Numerous refs.]

I. Pigs maintained for 100 days or longer on a ration shown by experiments on rats to be deficient in vitamin A, developed digestive troubles, an abnormal gait, and marked nervous symptoms, followed in some cases by complete collapse. Five pigs with nervous symptoms were cured by the administration of 100,000-400,000 I.U. of vitamin A daily. Others were cured by the administration of cod liver oil or dried whole milk. Inclusion of vitamin D in the diet did not prevent the onset of the symptoms. The administration of massive doses of vitamin A concentrate was investigated and it was found practical to give a single dose of 400,000-500,000 I.U., which sufficed to keep the pigs in good health on the deficient

diet up to bacon weight. The work from other laboratories is reviewed and the practical value of this investigation discussed.

Two pigs, receiving a synthetic diet deficient in the vitamin B complex, failed to gain in weight, became weak, and had dirty, coarse coats. The addition of 5% brewers' yeast to the diet rendered it satisfactory. Two other pigs which received an addition of 5% autoclaved yeast made very subnormal growth and eventually died ; signs of digestive disorders were evident, but there was no nervous collapse.

II. A purified basal diet, adequate except for the factors of the vitamin B complex, caused loss of appetite, exceedingly slow growth, impaired locomotion, lowering of the body temperature and respiratory rate, and sometimes death, when fed to young weaned pigs. Nicotinic acid, when added to this diet together with riboflavine and thiamin, fully protected similar pigs of like weights and ages. Still more rapid growth and weight increase were produced when the filtrate factor (as rice-bran filtrate) was added as well as nicotinic acid.—R. Allcroft.

Lepkovsky, S., Taylor, L. W., Jukes, T. H., & Almquist, H. J. (1938). **The Effect of Riboflavin and the Filtrate Factor on Egg Production and Hatchability.**—*Hilgardia.* **11.** 559-591. 5 figs., 17 tables. [Numerous refs.]

Investigations on White Leghorn hens continued over a period of two years showed that to rations composed primarily of cereals, cereal by-products, and fishmeal, the addition of riboflavine promoted egg production and hatchability, but when these were added to a ration composed primarily of polished rice and fishmeal, the egg production and hatchability were decreased. Riboflavine deficiency in breeding hens' diets produced characteristic embryonic abnormalities, such as degeneration of the Wolffian bodies, deformed down, oedema, reduced size, and anaemia.

No significant effect on egg production or hatchability could be attributed to the authors' " filtrate factor ", an extract from rice bran containing vitamin G.
—R. Allcroft.

Beauvallet, M. (1938). Sensibilité à l'acétylcholine de l'intestin grêle isolé du pigeon normal et du pigeon atteint de polynévrite. [**Sensibility to Acetylcholine of the Isolated Small Intestine of a Normal Pigeon and of a Pigeon Affected with Polyneuritis**].—*C. R. Soc. Biol. Paris.* **128.** 1020-1021. 3 figs. [2 refs.]

Isolated small intestine of the normal pigeon was only slightly sensitive to acetylcholine solutions of a dilution of 10^{-8} and 10^{-7}. Stronger solutions produced contractions which were more marked but of short duration. Addition of vitamin B_1 to the Ringer-Locke solution used for bathing the intestine caused a more marked and prolonged reaction to acetylcholine. There was no appreciable diminution of the sensitivity of the intestine to acetylcholine among pigeons fed on a vitamin B_1-deficient ration and exhibiting symptoms of polyneuritis, but the reaction was of a shorter duration than in normal birds.—R. Allcroft.

Nicolaysen, R., & Laland, P. (1938). **Observations on the Curative Effect of Nicotinic Acid and of Liver in the Canine Black Tongue Disease.**—*Skand. Arch. Physiol.* **79.** 299-302. 1 fig. [12 refs.] [In English].

Blacktongue accompanied by anaemia was produced in two dogs after eight weeks' feeding on a diet composed of Glaxo casein free from vitamin B, arachis oil, white maize meal, cod liver oil, sugar, and salts; crystalline vitamin B (250 I.U.) was injected twice weekly into each dog.

The tongue lesion cleared up on giving 50 mg. nicotinic acid daily, but anaemia persisted until raw ox liver was fed, after which the dogs regained their normal health and weight.—J. E.

I. THOONEN, J. (1938). Histologische letsels bij hondenrachitis. [**Histology of Rickets in Dogs**].—*Vlaam. Diergeneesk. Tijdschr.* **7.** 281-290. 7 figs. on 3 plates. [3 refs.] [English, French and German summaries].

II. VERSTRAETE, A. (1938). Roentgenologische beelden bij hondenrachitis. [**X-Ray Pictures of Rickets in Dogs**].—*Ibid.* 291-300. 7 figs. on 4 plates. [6 refs.] [English, French and German summaries].

I. The histological changes seen in cases of osteodystrophia in dogs were :– (a) The formation of much osteoid tissue and a few changes in the bone-marrow, indicating rickets, and (b) osteoporosis and the formation of fibrous bone-marrow, indicating osteodystrophia fibrosa. Whether these are independent diseases or two stages of one illness has not been determined.

II. In dogs with rickets the changes revealed by an X-ray photograph largely depend on the rate of growth and on the breed of the dog. Sometimes few changes are found even though the clinical symptoms are definite.

—JAC JANSEN (UTRECHT).

REZZESI, F. D. (1937). Studi sul rachitismo sperimentale. Nuovi orientamenti etiologici e patogenici indagati mediante esperienze colle sostanze fotodinamiche di origine ematica. [**Research on Rickets : the Action of Photodynamic Substances in the Blood**].—*Biochem. Terap. sper.* **24.** 274-281. [English, French and German summaries].

This is a preliminary note on experiments on the irradiation treatment of rickets in rats. R. believes that the long waves of the visible spectrum can act on certain photodynamic substances in the body, *e.g.*, porphyrin, to reduce or overcome rickets.

For this series of experiments he used haematoporphyrin, a photodynamic substance of animal origin, which is activated only by the green radiations of wavelength 5460 Å and the yellow radiations of 5770 Å of the visible spectrum, and with an already established relationship to the metabolism of calcium. Rachitic rats were used for all the experiments and were fed McCollum's rachitogenic diet. A solution of haematoporphyrin, in varying total amounts, was injected subcutaneously in doses of 0·5 c.c. into the gluteal region. Some of these rats were periodically irradiated by the sun's rays through ordinary window glass ; the rest were kept in absolute darkness throughout the experiment. Others which had been kept on the rachitogenic diet, but which were not given any haematoporphyrin, were also kept in absolute darkness. Another group was subjected to similar periodic irradiation, but was not given any haematoporphyrin.

The results of repeated X-ray and histological examinations showed that repeated injections of haematoporphyrin into rats with advanced rickets, followed by successive periods of sun irradiation through glass, led to the disappearance of rickets. There was an early and intense deposition of calcium salts in the rachitic areas. In the absence of light, the administration of haematoporphyrin led to only a slight deposition of calcium salts, especially in the metaphyseal region. The irradiation of rats not treated with haematoporphyrin had no effect on calcification.

PUBLIC HEALTH

MARTINEZ LANGAN, E. (1936). La inspección veterinaria municipal de la C. Federal. Su accion en profilaxis bromatológica. [**Municipal Veterinary Inspection in Buenos Aires**]. pp. 15. 1 fig. Buenos Aires: Sociedad de Medicina Veterinaria. [4to].

An account of the organization and execution of the Municipal Veterinary Inspection work in Buenos Aires. The author discusses at some length improvement that has been brought about in the marketing of animal produce in the city. He draws attention to the opening of the Institute for Food Inspection at which there is physical, chemical, bacteriological, and biological study of foodstuffs.

NARBUTAS, J. (1938). Kauno m. mèsos ir pieno sanitarine prieziura nuo 1927 iki 1938 m. sausio men. 1 d. [**Meat and Milk Control in Kaunas, 1927-1938**]. —*Vet. ir Zootech., Kovno.* **15.** 48-53. 4 tables.

Veterinary inspection of meat and milk products in Kaunas is carried out by the town veterinary surgeon and his assistants. Under his supervision he has 247 meat, sausage and fish shops, 19 sausage and preserved meat factories, 2 factories for fish products, 60 milk products shops, 40 hotel kitchens, one poultry abattoir, 7 markets, 6 tanneries, and one animal cemetery. The tables indicate the quantities of the different products inspected and bacteriologically examined during the year.

—A. PABIJANSKAS (KAUNAS).

FLORENTIN, D. (1938). La flore colibacillaire des fromages et les intoxications alimentaires. [*Bact. coli* **in Cheese and Food Poisoning in Man**].—*C. R. Acad. Sci., Paris.* **206.** 1060-1062.

F. investigated several cases of food poisoning in man due to cheese and also made a bacteriological study of cheeses eaten in France. They often contained indol-forming and non-indol-forming *coli* organisms, putrefactive bacteria, and enterococci, but he was unable to isolate any streptococci.

Pont l'évêque cheese which was the cause of cases of food poisoning was shown to contain more than 1,000 *Bact. coli* per gramme of cheese, and some enterococci.

Cooked cheeses of the Gruyère type did not contain *coli* organisms and the partially cooked Dutch cheese contained little or none. In fermented cheese in which mould fungi (particularly *Penicillium glaucum*) are the most active ripening agents, as for example in Roquefort cheese, no *coli* organisms were found, and very few were found in Camembert type cheeses.

In the soft types of cheese such as Pont l'évêque, *coli* organisms were often found. F. found indol compounds in several cheeses with a putrid smell. Their strong taste seems to be due to the presence of indol elements resulting from the action of coli on the casein. Certain varieties of *Bact. coli*, and even of salmonella, may form toxins and endotoxins under these conditions.

He concludes that cheese should be made from properly sterilized milk and selected cultures.

GOERTTLER. (1938). Strengere lebensmittelpolizeiliche Vorschriften zur Verhütung von Enteneiervergiftungen? [**Germany: Regulations for the Prevention of Food Poisoning from Ducks' Eggs**].—*Berl. tierärztl. Wschr.* April 8th. 205-208.

About 50 million ducks' eggs are used annually in Germany for human consumption. On an average (calculated for 1932-1937) they were the source of 29

outbreaks a year of food poisoning, involving 174 persons and causing six deaths. Under present regulations in Germany there must be a clear mark of identification and origin on every egg, and the retailer must exhibit a notice warning people of the dangers of uncooked ducks' eggs.

G. reports the case of a producer who voluntarily had the blood of his ducks examined. Between the 12th and the 19th of August, 1936, a bacteriological institute carried out a blood test on all ducks on his farm for *Salmonella enteritidis* and *S. typhi-murium*, and the birds were pronounced free from infection. In November of the same year, however, 29 persons were poisoned by eggs from this farm. *S.e.* was obtained from the faeces of these persons and from five eggs from the farm. A further case occurred in May, 1937. [It is inferred that there were no opportunities for the introduction of infection after the August test.]

G. points out that this is a case where the breeder went to trouble to get a clean bill of health and yet failed to safeguard himself. He concludes that the use of the agglutination test for this purpose is not a safeguard.—A. W. Möller.

THERAPEUTICS

Scorgie, N. J. (1938). **The Chemotherapy of Bacterial Infections.**—*Vet. Rec.* **50.** 1012-1014.

A summary is given of the data which have accumulated during the last three years regarding prontosil and other antistreptococcal drugs of the azo series. In human medicine sulphanilamide is regarded as the most generally useful drug of the group, oral administration serving all purposes except the immediate treatment of meningitis.

Drugs of the azo series are specific against infections due to *Streptococcus pyogenes* only, other streptococci being unaffected. Even among *Str. pyogenes*, resistant groups exist. Groups A and C are fully susceptible, Groups B, E, and G are variable in their susceptibility, and Group D is immune.

Among other infective agents, *Staphylococcus aureus* is at least moderately susceptible, and promising results have been recorded against *Clostridium welchii* and *Brucella abortus*. The low toxicity of prontosil and sulphanilamide in animals is emphasized, but toxic symptoms will arise in all species if these drugs are used in conjunction with sulphur-containing drugs.—D. D. Ogilvie.

Posgay, E. (1936). Adatok a tehenek fertőző hurutos tőgygyulladásának entozonnal való orvoslásához. **[Treatment of Mastitis with Entozon].**—*Közl. Oesszehas. élét- és kórtan Köréből.* **26.** 545-552.

Infusion of 500-1,800 c.c. of a 1:1250 solution of entozon at body temperature was made into each of 19 artificially infected quarters and nine naturally infected ones. It caused almost complete disappearance of streptococci within 20 hours, but they frequently reappeared 5-6 days later. A complete cure, by means of 1-3 infusions, was obtained in only 14 quarters (56%).—G. Sàlyi (Budapest).

Macrae, D. R. (1938). **Oral Administration of Brilliant Green in the Treatment of " White Scour " in Calves.—A Record of Three Years' Experience.**—*Vet. Rec.* **50.** 1620-1621.

The author reports that he obtained good results in the treatment of " white scour " in calves with brilliant green, being led to use this drug because of its inhibitory action *in vitro* on coliform organisms.—D. D. Ogilvie.

Labelle, G. (1938). Le para-amino-benzène sulfonamide dans le traitement de la polyarthrite des jeunes poulains. **[Treatment of Polyarthritis in Foals**

with Sulphanilamide].—*Bull. Soc. vét. prat. Fr.* **22.** 185-188. Discussion pp. 193-194.

It is stated that joint-ill causes an annual loss of 15-20% in foals in Quebec. L. treated about 200 affected foals, and reports rapid cure in 95% of the cases with sulphanilamide. The dosage for young foals was 15 g. *per os* in 1 g. doses spread over a period of five days, five doses being given on the first day, four on the next, and so on ; the drug was mixed with an equal quantity of sodium bicarbonate in a little of the dam's milk. Older animals were treated in the same way, but the dose was 8 g. instead of 1 g. In no case was anaemia noticed, but constipation and itching sometimes occurred, the latter disappearing when treatment was discontinued.

The discussion contains a brief account of the action of sulphanilamide and the possible dangers arising from its use.—N. J. SCORGIE.

PARNES, J. (1938). Beitrag zur Chemotherapie der Lymphangitis epiz. equi. [**The Chemotherapy of Epizootic Lymphangitis of Horses**].—*Berl. tierärztl. Wschr.* June 10th. 335-337. [Numerous refs.]

An account of the treatment of epizootic lymphangitis in 38 horses of which 24 were said to be cured, and three killed as incurable, the rest though apparently cured being still under observation. External and internal treatment were carried out simultaneously. Externally, one or other of the following drugs were used :– concentrated lactic acid, copper sulphate or iodoform in ether followed later by 5% biniodide of mercury ointment. Internal treatment took the form of intravenous or intramuscular injections of 0·25% biniodide of mercury, bismuth iodate, and trypanblue separately, in succession. The course of treatment was spread over several weeks, and was rather drastic in effect. In some cases the horses were given 150-200 c.c. of their own haemolysed blood intramuscularly—presumably as an empirical remedy.—A. W. MÖLLER.

ETTISCH, G., & DA COSTA, S. F. G. (1938). Sur les différences de réaction des substances biologiques aux solutions aqueuses et huileuses d'un même composé. [**Biological Reactions of Helminths to Aqueous and Oily Solutions of the Same Substance**].—*C. R. Soc. Biol. Paris.* **127.** 239-241. [2 refs.]

The authors studied the action of thymol and benzol in both watery and oily vehicles upon *Ascaris lumbricoides* and *Taenia serrata.* Various concentrations of these substances in Rhode-Saito solution of pH 6·4 at 37°C., and in oils (liquid paraffin, olive oil, ground-nut oil, sesame oil, linseed oil and nut oil) were tested as regards their effect on the tonus and frequency of contractions of the worms, and the time taken to produce paralysis.

The action of benzol and thymol in the watery solution was almost identical in each case upon both nematodes and cestodes. The effect of benzol in oily vehicles was more than twice as strong upon the nematodes, whereas thymol in the oily solutions, especially liquid paraffin, was much more active against the cestodes. These findings emphasize the importance of a correct choice of vehicle for anthelmintics.—C. V. WATKINS.

GROULADE, P. (1938). Traitement de la vaginite granuleuse contagieuse par dilatation gazeuse. [**Treatment of Granular Vaginitis by Gaseous Dilatation**]. —*Rec. Méd. vét.* **114.** 404-411. 1 fig. [13 refs.]

Contagious granular vaginitis of cattle is stated to be extremely prevalent in France. Ordinary antiseptics are incapable of reaching the organism considered

to be the cause (Hecker's *Streptococcus* studied by OSTERTAG) in the papillae of the vaginal mucous membrane. The treatment advocated consists in the injection, by means of a special syringe, of benzoated H_2O_2 and colloidal silver proteinate in a glycerinated base. Using this method, G. claims to have cured 34 out of 40 cases (38 chronic and 2 acute).—N. J. SCORGIE.

DETLEFSEN. (1937). Anwendung von Aricyl, Tonophosphan und Volkmarschen Mineralstoffpräparaten. [**Experience with Aricyl, Tonophosphan and Volkmar's Mineral Mixtures**].—*Berl. tierärztl. Wschr.* Sept. 10th. 561-563. [1 ref.]

An article recommending the use of the products named in the title. The only evidence of usefulness was based on general clinical observations.

BUREŠ, J. (1938). Přístroj k podkožní aplikaci kyslíku a jeho použiti při kyslíkové therapii koní zasažených b.ch.l. [**Trials of Subcutaneous Oxygen Therapy in Horses Poisoned by Phosgene**].—*Voj. zdravotn. Listy.* **14.** 268-281. 1 fig., 2 tables, 3 charts. [6 refs.] [English, French and German summaries].

B. describes experiments with a Grinkov—a gravity water system with two bottles—apparatus on 16 healthy horses, and on three poisoned with phosgene, the dose being 10-53 mg. given over a period of 15-19 minutes.

Horses can stand a dose of as much as 25 litres of oxygen subcutaneously, but it is advisable not to inject more than 5-6 litres in one place; 80% is absorbed within ten hours, and the rest in 2-5 days. With poisoned horses the absorption took place in about half the time. After large doses of O_2 the pulse was quickened, a danger in the case of horses with pulmonary oedema. It is suggested that in conjunction with other treatment (quiet, warmth, venesection and heart stimulants) the injection of oxygen would be of great value in phosgene poisoning.

After injection of 18-36 litres altogether in two or three doses each distributed over different sites at intervals of 3-6 hours, calm and improvement followed in this experiment, and after two days there were no more symptoms and the pulmonary oedema had disappeared.—V. CHLÁDEK (PRAGUE).

POISONS AND POISONING

I. SZABŁOWSKI, J. (1938). Zatrucia koni iperytem przez przewód oddechowy. [**Respiratory Poisoning of Horses by Mustard Gas (Yperite)**].—*Wiad. weteryn.* **17.** 385-396. [14 refs.] [French summary].

II. SZABŁOWSKI, J. (1938). Zatrucia koni adamsytem. [**Poisoning of Horses by DM (Adamsite)**].—*Ibid.* 397-401. [French summary].

I. The symptoms of mustard gas poisoning in horses are, 30 minutes after exposure :– inflammation and blinking of the eyes, swelling of the nasal mucosa, frequent neighing, yawning, heavy breathing and, later, sleepiness. Six to eight hours after exposure the action of the heart is weakened and there is pain in the region of the larynx, accompanied by a choking cough. After 5-6 days, complete blindness ensues, and there is a thick layer of secretion on the nostrils, and ulceration of the skin. The pulse is weak and there is loss of appetite. The respiratory organs are badly affected and there is choking and congestion in the lungs. The flesh of such animals can be consumed by human beings, with the exception of the lungs, if the affected animals are killed within 24 hours of contamination. The best protection for horses is a gas mask. [See also *V. B.* **6.** 549; **7.** 563, and **9.** 184-185.]

II. DM (adamsite ; diphenyl aminearsine chloride) is a potent nose irritant gas (arsenical smoke) which affects man more seriously than it does horses. The main symptoms in horses are inflammation of the eyes and respiratory organs, secretion from the nostrils, and, occasionally, coughing and quickened respiration ; affected horses are still able to work. In cases of severe poisoning the symptoms are frequent neighing, blinking of the eyes, difficult respiration and quickened heart action. The symptoms usually disappear after 24 hours. Horses killed by adamsite poisoning show congestion of the larynx, blood vessels and heart muscle, but deaths are rare. In most cases treatment will be found unnecessary. Water contaminated by adamsite should not be used.

BONNER, W. G. (1938). **Poisoning of Cattle. Black (or Garden) Nightshade.** —*N. Z. J. Agric.* **57.** 99-101. 1 fig.

Cattle which had been on the road for three days were put into a paddock containing an abundance of black nightshade (*Solanum nigrum*). Two and a half days later, one of the seven cows was found dead, two were down and semi-conscious and the other four were exhibiting symptoms of poisoning. The nightshade plants had been heavily cropped. Three more cows died by the following day. Symptoms and P.M. findings are described. Apparently the only abnormality found P.M. was a doubtful inflammation of the abomasum. The analyst reported the recovery of an appreciable amount of solanine from the stomach contents. —L. W. N. FITCH.

CARRA, L. (1938). Cecità in ovini e caprini procurata con Euphorbia myrsinites Linn. [**Injury to Sheep and Goats by** *E.m.*] —*Azione vet.* **7.** 366-367. 1 fig.

An account of injury to the eyes of some sheep and goats, suspected to have been caused by a mentally deficient youth hitting the animals over the eyes with euphorbia plants. The very irritant latex had caused severe inflammation.

CAIRNS, D. (1938). **Vegetative Propagation in Ragwort.**—*N. Z. J. Sci. Tech.* **20.** 173A-183A. 12 figs. [1 ref.]

Anatomical peculiarities of the plant which render eradication difficult are discussed.—L. W. N. FITCH.

PHYSIOLOGY

DEPPE, K. (1938). Untersuchungen über den Säurebasenhaushalt des Blutes, die Harnreaktion, sowie über Mineralgehalt des Blutplasmas und der Erythrocyten bei Rindern unter verschiedenen Fütterungsverhältnissen. [**The pH of the Blood, Urine Reactions and Mineral Content of the Blood Plasma and Erythrocytes on Different Diets**].—*Arch. wiss. prakt. Tierheilk.* **73.** 303-324. 1 fig., 30 tables. [Numerous refs.]

Cattle fed on sugar beet tops often develop osteomalacia. The work here described was undertaken in order to find any changes which may occur in the alkali reserve or mineral content of the blood. Six groups of cattle were examined :– (a) 12 fed on roots and concentrates ; (b) 5 at pasture ; (c) 5 fed on silage and concentrates ; (d) 5 milk-fed calves ; (e) 5 fed on fresh sugar beet tops and concentrates and (f) 14 fed on fermented sugar beet tops and concentrates. Of these, one animal in group (e) and ten in group (f) showed symptoms of osteomalacia.

It was found that the alkali reserve of groups (a), (b), and (c) lay within normal

limits ; that of groups (d) and (e) was reduced slightly beyond normal limits while that of group (f) was further reduced. The pH of the blood varied from 7·3-7·4 in group (a) and from 7·15-7·28 in group (f). The pH of the urine fell with the alkali reserve, while the titratable acidity of the urine and the ammonia content rose. The calcium, phosphorus, potassium and magnesium values were lowered in group (f), but the sodium remained constant and chlorides were increased. Wide variations in all estimations occurred with each group. The reduced alkali reserve and the fall in serum phosphorus below 4 mg. %, and the increased titratable acidity and ammonia content of the urine are considered to be diagnostic of subclinical or clinical osteomalacia.—A. T. PHILLIPSON.

ROCHE, J., FILIPPI, Angèle, & MORGUE, M. (1938). Sur les réactions générales du squelette consécutives à la fracture d'un os. [**Reactions of the Skeleton after Bone Fracture**].—*C. R. Acad. Sci., Paris.* **207.** 254-257. 1 fig. [1 ref.]

The authors carried out experiments on 57 pigeons to determine whether any general change in bone metabolism occurs during the repair of a single fractured bone. They determined the P:N ratio of the two humeri in 24 normal pigeons, and in 33 pigeons in which one humerus had been broken ; they also calculated the phosphatase activity in the same bones. They reached the conclusion that, when any long bone is broken, a greatly increased phosphatase activity can be observed in all the long bones, in addition to other changes in their chemical composition signalized by variations in the P:N ratio. These variations show that there was at first a general fall in the mineral content of the whole skeleton, and finally absorption of phosphates both in the injured bone and in all the other bones.

YOFFEY, J. M., SULLIVAN, E. R., & DRINKER, C. K. (1938). **The Lymphatic Pathway from the Nose and Pharynx. The Absorption of Certain Proteins.** —*J. exp. Med.* **68.** 941-947. 1 table. [15 refs.]

Experiments were carried out on a number of cats, dogs, monkeys and a rabbit, under nembutal anaesthesia, to determine whether various proteins were absorbed by the nasal mucus membrane. Solutions of different proteins were dropped into the nose ; the cervical lymph ducts were then cannulated and the lymph subjected to examination for the particular protein by means of the ring precipitin test.

Egg albumin, the protein with the smallest molecular weight of those examined in this study, was found in the lymph in all cases except one, whereas horse serum was never detected. Serum albumin was not found in the lymph of any of the cats, but was present in one rabbit lymph. Although the dye T-1824 is readily absorbed when given in saline, no dye was found in the lymph when a 1% solution in horse serum was employed ; a small amount was found, however, when a 5% solution was used, thus confirming previous observations that T-1824 combines with serum proteins. Since no irritant volatile anaesthetics were employed, there was no question of the results being affected owing to damage to the nasal mucosa.—ALFRED EDEN.

TECHNIQUE AND APPARATUS

DUKES, C. E. (1939). **Examination of Small Quantities of Urine.**—*Lancet.* **236.** 24-26. [4 refs.]

Details are given of a method for the estimation of urea in 0·1 ml. urine, based on the hypobromite reaction, the N_2 liberated being collected and measured in a Van Slyke volumetric gas apparatus. The method has been carefully checked against various urease comparative methods and is sufficiently accurate for clinical

interpretation. By slight variations of stock methods, specific gravity, microscopic and bacteriological examinations, and urea estimations can be carried out on 0·5 ml. samples of urine such as are collected by catheterization of the ureters, and in addition the methods are applicable to the examination of small quantities of discharges to decide whether or not these contain urine. The methods would be particularly suitable for the examination of samples of urine from small animals in clinical and experimental conditions.—ALFRED EDEN.

SIMONS, H. (1938). Nouvelles applications du mélange colorant saponinebleu de méthylène à l'étude des protozoaires sanguicoles. [**New Uses of the Saponin-Methylene Blue Staining Mixture in the Study of Blood Protozoa**]. —*Ann. Parasit. hum. comp.* **16.** 334-340. [6 refs.]

In a further study of the staining properties of his saponin-methylene blue mixture [*V. B.* **8.** 668.], S. found that, when one part of infected blood is added to 5-10 parts of the mixture, trypanosomes or spirochaetes are killed, and together with the leucocytes and stroma of the red corpuscles they are agglutinated into relatively large blue clumps. If these clumps are examined microscopically the parasites can be seen easily, and by differentiation with 0·1 % acetic acid the red cell remnants and the leucocytes can be partly decolorized, leaving the parasites deeply stained. *Leptospira icterohaemorrhagica* stains well with this mixture, and can be easily detected in blood or urine in high dilution. The mixture will also reveal piroplasms in thick smear preparations.

It can also be used as a preservative, so that blood can be kept in bulk and, if required, can be centrifuged prior to examination for parasites. It also stains blood platelets and leucocytes well and may prove of considerable value in haematology.

The stain has the following composition :– distilled water, 300 c.c. ; methylene blue, 0·6 g. ; sodium chloride, 1·8 g. ; sodium citrate, 3 g. ; saponin 2 g., and 15 % formol, 12 c.c. The stain and the salts are dissolved in warm water and after being cooled the saponin is added, the mixture being shaken for some minutes so that it is completely dissolved. Then formol is added to inhibit the growth of bacteria and fungi.—U. F. RICHARDSON.

MISCELLANEOUS

LEFANU, W. R. [M.A. ; Librarian, R.C.S.] (1938). **British Periodicals of Medicine.** pp. 93. Baltimore : The Johns Hopkins Press. [Reprinted from *Bull. Inst. hist. Med.* (1937). **5.** Nos. 8 and 9, and (1938). **6.** No. 6].

A list of periodicals " issued in all British lands ", confined to medicine and its specialities, including anthropology and pharmacy, but excluding veterinary medicine.

—. (1938). **American Type Culture Collection. Catalogue of Cultures.** pp. 159. Washington : Georgetown University School of Medicine. [4th Edit.] [8vo].

The American Type Culture Collection was founded on a collection made in 1911 by the American Museum of Natural History, New York and after sundry moves was transferred to the School of Medicine of Georgetown University, Washington in 1937, where 1,000 new cultures were added, bringing the total to 2,600. This edition of the catalogue covers the enlarged collection.

The functions of the collection resemble those of the National Collection of

Type Cultures, maintained by the Medical Research Council at the Lister Institute, London: the preface contains the rules for persons wishing to send or obtain cultures.

The catalogue material is arranged in alphabetical order of genera, and is based on the nomenclature of the Society of American Bacteriologists.—J. E.

OFFICIAL AND OTHER REPORTS

GREAT BRITAIN. (1935). **British Empire Cancer Campaign. Yorkshire Council. Reports and Accounts for the Year Ended March 31st, 1935.** pp. 18. [fcp].

Three lines of research are outlined :– PASSEY's work on gastric papilloma in rats [see p.488], HAVARD's work on the action of X- and γ-rays on cells, and BONSER's work on heredity in mammary cancer in strains of mice ; the two latter investigations were not complete at the time of publication of the report.—J. E.

NEW ZEALAND. (1938). **[Report of] Live-Stock Division [1937-38].** [BARRY, W. C.]—*Rep. Dep. Agric., N.Z., 1937-38.* pp. 9-21. 2 tables.

STAFF.—During the year nine veterinary officers were added to the staff. Still further additions were necessary, but great difficulty was experienced in securing suitably trained men for special investigational work.

ANIMAL DISEASES

CATTLE DISEASES.—The tuberculin test was applied to 16,509 cattle, of which 6·9% reacted. Compensation was paid for 7,207 head of cattle condemned as the result of the tuberculin test or of clinical examination. Of 500,787 cattle examined at abattoirs and meat-export slaughter-houses, 7·38% were affected in some degree with TUBERCULOSIS. The Director stressed the desirability of systematic tuberculin testing with a view to gradual eradication. Fifteen additional farms were found to be affected with JOHNE'S DISEASE. Control still presents difficulties, owing to the uncertainty of diagnostic methods. Control measures by vaccination continued to be satisfactory for BLACKLEG. The usual condemnations are recorded in cases of ACTINOMYCOSIS, ACTINOBACILLOSIS, and malignant growths, compensation being paid in the case of the last-mentioned.

SHEEP DISEASES.—Ante-natal vaccination of ewes to protect lambs against ENTEROTOXAEMIA continues. Results are considered satisfactory. Vaccination gives excellent results against CONTAGIOUS ECTHYMA in lambs. Legislation was passed enabling arecoline hydrobromide to be provided for each dog at the time of registration, in order to control HYDATID DISEASE.

Losses from PREGNANCY TOXAEMIA in ewes occurred under the usual conditions of feed shortage. In the lack of adequate supplementary feed the ewes received a severe check just before lambing time. An extremely severe outbreak of FACIAL ECZEMA [PHOTOSENSITIZATION] occurred in the autumn of 1938. The climatic conditions predisposing to the outbreak are recorded, *viz*, an exceptionally warm summer, with dry feed conditions in January, followed by heavy rainfall and rapid growth of grass in February. The disease appeared towards the end of February and was particularly severe in the South Auckland province. An extensive research organization was set up to investigate the disease. Departmental officers are co-operating with officers of the Lincoln Agricultural College in a survey of the causes of mortality in lambs and hoggets in Canterbury.

SWINE DISEASES.—Of 1,079,895 pigs slaughtered and coming under inspection for TUBERCULOSIS, 18·41% were affected in some degree. Three chronic cases of SWINE ERYSIPELAS were recorded during the year. SWINE PARATYPHOID is considered responsible for considerable mortality in young pigs.

SWINE HUSBANDRY

The report of Mr. M. J. SCOTT, Superintendent of the Swine Industry, is appended. The progress of the industry is illustrated by a table giving the total number of pigs killed annually from 1928-1937. This shows an increase from 476,828 to 1,120,905. The number of killings per sow during this time increased from 5·7 to 10·7. Grading of baconers according to standards employed by English bacon-curers was adopted. Grading standards are based on thickness of fat over shoulder and loin.

VARIOUS

HORSE BREEDING.—During the year the Remounts Encouragement Act of 1914, providing for a subsidy to owners of stallions, was put into effect. Good prices for draught horses were being realized, and the breeding of high-class Clydesdales continued. It was felt, however, that legislation ensuring the soundness of draught horses should now be introduced.

LIVE-STOCK STATISTICS.—Sheep increased by 1,192,114 to 31,305,818, dairy cows by 15,983 to 1,935,524, and horses increased by 1,629 to 277,799, while pigs decreased by 6,044 to 802,419.

MEAT INSPECTION AND SLAUGHTER OF STOCK.—The following stock was slaughtered at registered premises :– sheep, 3,351,208 ; lambs, 9,957,739 ; cattle, 588,656 ; calves, 1,079,572, and swine, 1,085,107.

IMPORTATION OF STOCK.—The following stock was imported during the year :– cattle, 55 ; sheep, 514 ; pigs, 16, and horses, 38.

EXPORTATION OF STOCK.—The following animals were exported during the year :– sheep, 13,716 ; cattle, 83 ; pigs, 28, and horses, 8.—L. W. N. FITCH.

NEW ZEALAND. (1938). **[Report of] Veterinary Laboratory, Wallaceville, Year ending 31st March, 1938.** [HOPKIRK, C. S. M.]—*Rep. Dep. Agric. N.Z.*, 1937-38. pp. 22-27. 2 tables.

CATTLE DISEASES.—The bromthymol blue test was used extensively as a field diagnostic test for the diagnosis of MASTITIS. The incidence of MASTITIS in the laboratory herd, which included 22 newly calved heifers, is described.

Tests for JOHNE'S DISEASE were conducted each half-year on 35 herds. Of 2,956 cows tested with johnin, 3·5% reacted.

SHEEP DISEASES.—A serious epizootic of PHOTOSENSITIVITY occurred in the Waikato following autumn rains.

No more farms were found infected with TRICHOMONIASIS. An experiment was commenced to test the effect of diet on bull fertility. It was chiefly designed to determine the effect of varying concentrations of protein.

In the attempt to control STERILITY, work on artificial insemination of cows was continued, but only 39% held. During the year, the semen of 1,170 bulls and of a small number of stallions, boars and rams was examined.

A survey of the cause of sheep mortality in Canterbury was commenced. The sheep were found to be heavily parasitized and ENTEROTOXAEMIA was diagnosed not only in lambs but also to some extent in hoggets. Experiments on the toxicity of ragwort were continued.

PIG DISEASES.—Three chronic cases of SWINE ERYSIPELAS were reported during the year. *Stephanurus dentatus* was reported for the first time in New Zealand. Further experiments are recorded on zinc poisoning.

PARASITOLOGY.—Work on blowfly trapping continued, but, owing to shortage of staff, observations on intestinal parasites of sheep was confined to the surveys done in connexion with mortality in Canterbury.

Myxas ampulla was shown to be the intermediate host of *Fasciola hepatica* in Hawke's Bay.

Diagnostic Section.—9,360 specimens were examined at Wallaceville and 42,006 (chiefly milk samples) at Hamilton sub-laboratory. The manufacture and distribution of vaccines and sera was carried out as usual. A number of titrations of lambs' sera following active immunization of their dams against Enterotoxaemia were carried out.

The transmission of Myelogenous Leucaemia by intraperitoneal injections of filtrates and suspensions was demonstrated in fowls.

Pasteurization of Skim Milk for Pigs.—An experiment was carried out to test the value of a farm pasteurization plant. It was found that milk containing tubercle bacilli, if maintained at a temperature of 170°F. for 30 seconds, was harmless to g. pigs on inoculation.

Nutrition Section.—Work on relation between dietary protein and sterility in rats and pigs was continued.

Magnesium metabolism in relation to the formation of urinary calculi is discussed. Experiments on the physiological action of cobalt were initiated.

During the routine biochemical work 703 specimens of blood, urine, etc., were examined.—L. W. N. Fitch.

New Zealand. (1938). **[Report of] Chemistry Section [1937-1938].** [Grimmett, R. E. R.]—*Rep. Dep. Agric. N.Z., 1937-38.* pp. 57-62. 1 table.

Bush Sickness.—The survey of the cobalt status of the North Island pastures was continued and cobalt was used in conjunction with superphosphate in top-dressing experiments in various parts of the Island. Definite improvement in health of stock is claimed, and it was found that the cobalt content of the pasture was increased by as much as ten times, following the application of one-quarter to one-half pound cobalt per acre.

Ovine Enzootic Icterus.—Livers of affected animals were found to have a high copper content.

Iodine Survey of New Zealand Live-Stock.—The work done is described.

Phosphorus Deficiency.—Certain volcanic soils were shown to be very poor in available phosphorus owing to strong phosphate fixation. Sheep and cattle on this country had long exhibited symptoms of pica. Feeding with bone-meal overcame the trouble.

Toxicology.—Zinc feeding to pigs at levels as low as 0·05% and 0·005% zinc in milk resulted in arthritis and mortality.

An interesting case of suspected arsenic poisoning was reported from the Reporoa district, in which there are a number of thermal and mineral springs. General stock health had been reported to be unsatisfactory. The discovery of arsenic in the mud and water in a drain on one farm led to further investigations, which are still continuing. It was found that the mud deposited by the Waiotapu River was arsenical, the arsenic apparently being present in combination with iron and as sulphide. In drainage waters, arsenic up to 3·75 mg. As_2O_3 per 100 c.c. was found, in mud to 2·5%, in soil up to 0·3%, and up to 2·3 mg. per 100 g. dry matter in grass. In a cow that died under suspicious circumstances the dry marrow and femur contained 0·6 mg. and 0·25 mg. per 100 g. respectively.

Chemical Control of Ragwort.—Experiments with sodium chlorate are recorded. It was found very difficult to kill the roots completely owing to poor translocation of the weedicide within the root system. It was, however, possible by this means to reduce the concentration of ragwort considerably and replace almost pure stands of ragwort by productive pasture swards.—L. W. N. Fitch.

GOLD COAST COLONY. (1938). **Report on the Department of Animal Health for the Year 1937-38.** [STEWART, J. L.]. pp. 30. 2 tables. 1 map. Accra: Govt. Printer. [fcp] [2s.]

ANIMAL DISEASES.—TRYPANOSOMIASIS remains the important enzootic disease. Much work has been done in connection with the disease itself and in attacking the tsetse vector by bush clearing. Tartar emetic is the most convenient effective drug. RINDERPEST was confined to a few small outbreaks among young stock and the few casualties at the annual anti-rinderpest immunization camps. The usual annual immunization of young stock was carried out. This procedure aims at the production of the very mildest of reactions, and so limits the mortality rate; tests prove that a satisfactory immunity ensues. 12,194 young cattle were immunized with a mortality rate of just over 2%. There were several outbreaks of CONTAGIOUS BOVINE PLEURO-PNEUMONIA. Satisfactory control was effected chiefly due to the efficiency of the anti-pleuro-pneumonia vaccine produced at the laboratory. Mass vaccinations were done in danger areas. Over 50,000 cattle were treated. Short observations are made on other diseases.

RESEARCH.—Anti-rinderpest products, contagious bovine pleuro-pneumonia and anti-rabies vaccines, tsetse research and eradication, and examination of pathological materials were the main activities of the Veterinary Laboratory, but other research was also accomplished. A virus disease of poultry not previously experienced was investigated. In some respects it has resemblances to Newcastle disease and contagious laryngotracheitis.

ANIMAL HUSBANDRY.—This features largely in the Department's activities. A scheme for the development of the cattle of the Northern Territories, financed by a Government grant and by contribution from the native administration was approved. It consists in the extension of the Native Administration farm plan, which has been proved successful, and the restocking of certain areas with cattle. Considerable progress has already been made; seven new Native Administration farms are under construction and others are projected, and cattle have been introduced into four new areas. The main object of Native Administration farms is the production of improved bulls for issue to village communal herds. They are also demonstration centres for improved farm husbandry generally. The Departmental livestock farm is the centre for all livestock (cattle, pigs and poultry) improvement activities, including breeding and livestock food experiments. From it improved livestock are issued to Native Administration farms and villages.

Other matters reported on include the marketing of animals and animal products, and veterinary training of Africans.—A. FULTON.

GERMANY. (1938). Sammelbericht der Reichszentrale für die Bekämpfung der Aufzuchtkrankheiten in Hannover. Berichtszeit 1 April, 1936 bis 31 März, 1938. [**Ninth Report of the Reich Centre for the Control of Diseases of Breeding and Newborn Animals, Hanover, from April, 1936 to March, 1938**]. [MIESSNER, H., SCHOOP, G., & HARMS, F.]—*Dtsch. tierärztl. Wschr.* **46.** 546-559, 561-568. 14 tables.

This report contains the substance of reports sent in by 39 institutes. After a request for the standardization of reports and a list of the individual reporters, the scientific matter follows in the usual form. [The previous report should be seen for comparison—*V. B.* **7.** 290].

DISEASES OF HORSES

STERILITY.—36,000 mares were examined for capacity to breed, and half of the 19,927 requiring treatment were cured. The customary statistical and therapeutic data are presented.

ABORTION.—6,124 investigations were carried out and 11,080 samples of blood were tested for paratyphoid infection, 12·9% being positive. 1,257 foetuses were examined, *Salmonella abortus-equi* was diagnosed in 14·6%, *Bacterium coli* in 5·1%, *Streptococcus pyogenes* in 3·9%, *Bact. equirulis* in 0·5%, micrococci in 5·2%, and a virus in 1·9% [see *V. B.* **8.** 716]. In 69% of cases there was no bacterial infection, and these were regarded as due to errors in management and diet. Hormonal diagnosis of pregnancy was applied to 5,700 samples of blood and urine. This is now a routine measure and the results are accurate.

DISEASES OF FOALS.—2,512 deaths were investigated, the P.M. findings being given under 17 headings; bacteria were incriminated in about 1,100. Joint-ill in the early days of life (*Bact. equirulis* infection) caused the greatest loss, followed by the so-called late joint-ill (streptococcal infection).

PARASITIC DISEASES.—3,758 faecal examinations revealed the presence of strongyles in 76% and ascarids in 19·2%. Infestation of sucking foals confined with their dams indoors is thought to be very common.

DISEASES OF CATTLE

STERILITY.—Over a quarter of a million bovines were examined and 68,277 required treatment; the percentage of cures varied between 63% and 80%. The causes of sterility, as diagnosed, are given in a table; endometritis and persistent corpus luteum headed the list with 19,000 and 18,000 cases respectively. Trichomoniasis appeared to be on the increase. Numerous individual reports on therapy are quoted.

ABORTION.—About 109,000 out of one and a half million blood samples (7·1%) were positive for brucellosis and 20,000 out of 287,000 milk samples (6·9%). Trichomoniasis was incriminated as a cause of abortion in some 1,500 cases and tuberculosis in nearly 500.

DISEASES OF CALVES.—Results of diagnostic work on 7,000 calves are listed in a table. *Bact. coli* appears in 23·4% of cases and streptococci in 9·9%.

PARASITIC DISEASES.—A short table gives the results of faecal examination from 2,430 ruminants. Stomach worms were diagnosed in 45·6%, and liver flukes in 38·4%, other species being unimportant.

DISEASES OF SWINE

STERILITY.—Three cases of male sterility are mentioned.

ABORTION.—443 foetuses and 290 blood samples were examined; 88·5% were negative bacteriologically and 6 bacterial species were incriminated in the remainder.

PIGLET DISEASES.—Over 9,000 carcasses were examined, diagnostic findings being given in a long table. No single cause accounted for more than 10% of deaths. The most frequent causes were heart muscle degeneration, gastro-enteritis, piglet influenza and *Bact. coli* infection.

DISEASES OF SHEEP

STERILITY.—Nothing to report.

ABORTION.—312 aborted foetuses were examined. *Salmonella abortus-ovis* was incriminated in 33%, spirilla in 10·6%, brucella in 2·6% and four other organisms in a few further cases.

DISEASES OF LAMBS.—A list of diagnosed causes of death in 2,700 lambs is given. Parasites accounted for 34·6%, pasteurella for 12·2% and the rest had a very diverse aetiology.

PARASITIC DISEASES.—Stomach worm disease was on the increase and lung-worms and liver flukes caused great loss in some parts.

DISEASES OF GOATS

A few lines on sterility and diseases of kids are given.

DISEASES OF FUR ANIMALS

1,016 foxes, 58 mink, 26 nutria and 13 raccoons were examined.

FOXES.—Short general notes on sterility and abortion are given, also a table with 25 causes of death in 1,016 cases. Lungworms accounted for 11%, tuberculosis for 10%, *S. enteritidis* infection for 7·8% and management errors for 7·2%.

MINK.—The chief cause of mortality in 58 animals was gastro-enteritis; most of the other deaths were caused by TB. and streptococcal infection.

NUTRIA.—26 were examined, and gastro-enteritis, *S. enteritidis* infection and pseudotuberculosis were incriminated each in three cases.

DISEASES OF POULTRY

Numerous reports are quoted. 32,800 fowls were sent for examination; the findings are in tabular form. Similar tables are given for 631 geese, 364 ducks, 277 pigeons, 34 turkeys, 11 pheasants and 5 peafowl.—J. E.

GERMANY. (1938). Die Tätigkeit der Staatsanstalt für Tierseuchenbekämpfung in Mödling auf dem Gebiete der Aufzuchtkrankheiten. [**Work of the Mödling Government Institute, Vienna, for the Control of Animal Diseases —Breeding Diseases**]. [GERLACH, F.]—*Dtsch. tierärztl. Wschr.* **46.** 740-744. 8 tables. [3 refs.]

Between April, 1936 and April, 1938, 66,384 diagnostic examinations were performed, 28,000 being for poultry diseases and 25,000 for brucellosis.

BOVINE ABORTION.—Over 20,000 slow agglutination blood tests were carried out: 19% were positive and 2·8% doubtful. Similarly, 7·5% and 1·4% of 1,000 milk tests were positive and doubtful respectively, whilst one-third of 308 foetuses were positive for brucella infection. Other causes of abortion were trichomoniasis, streptococci, *Corynebacterium pyogenes*, tubercle bacilli, spirillae and *Bacterium coli*.

Trials with a formolized vaccine and a preparation called "Abortotensin" in newly infected herds gave good results in reducing the number of abortions in the next series of pregnancies.

CALF DISEASES.—In 436 calves examined P.M., the following were the chief causes of death :– streptococci, *Bact. coli*, infectious pneumonia and paratyphoid infection.

DISEASES OF LAMBS AND KIDS.—A few cases only were examined, and results are given in a table.

EQUINE ABORTION.—Forty-one aborted foetuses were examined, *Salmonella abortus-equi* and *Bact. coli* each being incriminated in 12%. A killed vaccine was used on mares which had aborted as a result of *S. abortus-equi* infection.

FOAL DISEASES.—The chief causes of death in 66 foals were streptococci, *Bact. equirulis*, *Bact. coli* and *S. abortus-equi*. For prevention, vaccination of mares was carried out.

POULTRY DISEASES.—Results are given in a table: of 26,458 blood agglutination tests for pullorum disease, only 5·6% were positive.—J. E.

HOLLAND. (1937). Verslag van den directeur van den veeartsenijkundigen dienst omtrent de werkzaamheden van den veeartsenijkundigen dienst en den gezondheidstoestand van den veestapel in 1936. [**Report of the Veterinary Service for 1936**]. [BERGER, H. C. L. E.] pp. 118. 26 tables. 's-Gravenhage: Algemeene Landsdrukkerij. [4to] [F 1].

The report contains lists of the names of veterinary and other State inspectors

concerned with animal health, and a comprehensive account of prevailing animal diseases, together with information on imported and exported animal products.

ANIMAL DISEASES.—The situation with regard to BOVINE TUBERCULOSIS is described in detail in texts and tables. The State control is based on the use of the ophthalmic tuberculin test and the building up of clean herds ; " open " cases are slaughtered under compensation and other reactors are dealt with according to Bang's method of eradication. The scheme suffered a slight setback during the year on account of financial stringency. There were 23,627 farmers enrolled in the scheme, involving 304,080 cattle. The percentage of infection over the whole country was 16·8, being lowest in Friesland (4·3). The state of affairs in different provinces is described fully. BCG vaccine was used on some farms, with a high rate of reaction.

JOHNE'S DISEASE seemed also to have increased.

BRUCELLA INFECTION in cattle appeared to be on the increase. TRICHOMONIASIS was also noted. ANTHRAX and BLACKLEG were rather rare.

The history of FOOT AND MOUTH DISEASE and SWINE FEVER in the different provinces is related. AUJESZKY'S DISEASE, which had previously given some trouble in Holland, was not observed in 1936. There were no cases of SHEEP POX or RABIES.

Other common diseases of farm livestock are described, but do not call for detailed description here.—JAC. JANSEN (UTRECHT).

HOLLAND. (1937). Verslag van de werkzaamheden der Rijksseruminrichting over 1936. [**Report of the Rijks Serum Institute for 1936**]. [LOURENS, L. F. D. E.] pp. 100. 1 fig. on 1 plate, 19 tables. 's-Gravenhage-Algemeene Landsdrukkerij. [8vo] [F 1].

This record of the serum institute at Rotterdam gives a summary of the sera, vaccines and diagnostic agents prepared. A report is given of the material sent for diagnosis.

New products were serum, prepared from horses, against *Leptospira icterohaemorrhagiae*, and formolized BLACKLEG culture vaccine. The Director considered however, that this vaccine would be no improvement on the products already in use, *viz*, blackleg filtrate, blackleg muscle powder and blackleg spore vaccine in cotton wool. Another new product was the formolized SWINE FEVER vaccine. The report mentions that during the preparation of the vaccine gas-forming bacilli were sometimes troublesome ; gas oedema sometimes developed after its use. It is stated that the vaccine was not the cause of this infection, which, it is said, resulted from bad injection technique.

REESER did research work on the Dujarric flocculation reaction for the diagnosis of brucella infection in cows. This method was not so satisfactory as the methods of diagnosis already known.—JAC. JANSEN (UTRECHT).

HOLLAND. (1938). Mededeelingen betreffende den Gezondheidsdienst voor Vee in Friesland. Negentiende jaarverslag 1 Mei 1937-30 April 1938. [**Report on the Livestock Health Services for Friesland, 1937-1938**]. [VEENBAAS, A. H.] pp. 59. 3 tables. [8vo].

A summary is given of control methods for infectious diseases in Friesland. A comparison of the results obtained in combating TUBERCULOSIS during 1937 and 1938 is made, as follows :– in 1937, 9,961 farms (199-372 head of cattle) were examined ; there were 23,193 positive reactors (11·6%), while 6,110 farms were proved to be free of TUBERCULOSIS ; in 1938, 10,300 farms (210,450 head of cattle)

were examined, and 20,270 animals were positive 9·6%), 6,783 farms being free of the disease.

In combating JOHNE'S DISEASE the isolation of calves during the first year is considered to be very important; all affected animals should also be isolated. The intradermal test with avian tuberculin gives many doubtful results, but is stated to be the most reliable test available.

161 foetuses and placentas were examined for *Brucella abortus* INFECTION and the organism was found 80 times.

A polyvalent live vaccine was used for immunization of pregnant cows: it gave good results. Intradermal injections with formolized vaccines and with methyl violet vaccines are being tried out.—JAC. JANSEN (UTRECHT).

BOOK REVIEWS

KELSER, R. A. [Lieut. Colonel, Veterinary Corps, United States Army; Chief Veterinary Division, Surgeon General's Office, War Department, Washington, D.C.] (1938). **Manual of Veterinary Bacteriology.** pp. xiii + 640. 93 figs., 11 tables. London: Baillière, Tindall & Cox. [3rd Edit.] [8vo] [27s. 6d.]

The third edition of this book has been rendered necessary because of its adoption for teaching purposes and because of the extensive advances in bacteriology and immunology in recent years. This branch of biology is a living and interesting study and it is to be regretted that one of the few books devoted to the veterinary aspect of bacteriology is so dull and uninteresting. The student who wishes to delve into the exciting problems of infectious diseases of domesticated animals will find little here to stimulate his curiosity.

There are 12 parts covering a wide field and including the pathogenic fungi, protozoa and viruses. The sections on bacteriological methods, the serological tests commonly employed and the preparation of veterinary biological products could have been curtailed, for such matters can only be learnt adequately at the bench. This would have allowed room for the expansion in immunology which, according to the preface, the author would have liked. There is a good chapter on bacterial variation, but the information given here is not applied in the chapters on systematic bacteriology. The antigenic analysis of the salmonella group is ignored in the description of members of this genus, and the differentiation of the different species is vague and passed off with the phrase "Agglutinin absorption tests are more reliable". Separate descriptions of *S. typhi-murium*, "*S. aertrycke*" and "*S. psittacosis*"—considered by most to be the same organism—are given. Other work of recent years is also omitted, for example:– the antigenic analysis of the brucella group, the toxic fractions formed by the types of *Clostridium welchii*, and the flagellar and somatic antigens of various clostridia. *Actinomyces bovis* is stated to gain access to the body by barley awns and to be responsible for "wooden tongue", whilst the description of the organism savours more of a saprophytic actinomyces. The statement that tuberculosis of dogs and cats is rare, but that when it does occur it is usually found to be due to the human type, is not wholly in accordance with accepted views.

Bergey's classification is used and so, while we have "*Salmonella pullorum*", on the one hand, on the other we have "*Shigella gallinarum*". *Corynebacterium pseudotuberculosis* is given as a synonym for *Pasteurella pseudotuberculosis* and, although there is some explanation on pp. 360-361, the true position of there being a *Past. pseudotuberculosis* (*rodentium*) and a *Corynebact.* (*pseudotuberculosis*) *murium* is not given.

There are short descriptions of the virus diseases, the pathogenic fungi and the protozoa of veterinary importance. Neither in the bacteriological nor in the protozoological sections is there a sufficiently close linkage between the description of the parasite and its association with the disease processes, and the angle of study for the purpose of controlling infectious diseases is thus too narrow.—R. LOVELL.

DOERR, R., & HALLAUER, C. [Editors]. (1938). Handbuch der Virusforschung. Erste Halfte. [**Text-Book on Viruses. Part I**]. pp. xii + 546. Numerous figs. and tables. [Numerous refs.] Vienna: Julius Springer. [8vo] [RM. 66]. [In German and English].

This, the first half of an ambitious work on viruses, is an attempt to fill a serious gap in scientific literature. Research on viruses has advanced rapidly during the last few years, with the result that only specialists are able to keep up to date. A number of these specialists, each in his own language and on his own subject, have combined to produce this book. The authors are all well known as experts in their own lines of research, and the result is a magnificent production which will be of great service to all whose work deals with viruses. The most recent methods and results are described in detail, with a critical review of published papers. There are chapters on :– virus research, the sizes of viruses and bacteriophages, fluorescence microscopy, staining methods for virus particles, inclusion bodies and their relationship to viruses, isolation of viruses in tumour explants, growth of virus on the chorio-allantoic membrane, inactivation of viruses by different agents, and the chemical and physical properties of viruses. A valuable part of each section is a very complete bibliography. The book is well printed, with numerous illustrations—many in colour—of the first quality.—G. SLAVIN.

GRAY, A. A. [M.D., F.R.S.E., Formerly Lecturer on Diseases of the Ear, Glasgow University]. (1937). **The Basis of Tissue Evolution and Pathogenesis.**—pp. xix + 92. 11 figs. Glasgow: Jackson, Son and Company. [8vo] [7s. 6d.]

No one who reads this essay will deny that there is much that is attractive in the theory of Induced Variation and its relationship to pathogenesis and directional evolution. Without touching on the question of large-scale changes in environment, such as those which marked the Pleistocine and which culminated in the Psychozoic era, the author is more concerned with small-scale changes like those associated, for example, with the evolution of the muscle-fibres from the epithelium of coelenterates. " A number of animals of a given species are living in a certain environment. All these animals have cells and tissues which possess respectively similar qualities, but no two possess them in identical degrees ". If the environment changes the responses of the cells and tissues will, in view of the similarity of their qualities, be of the same general order, but as the cells of similar tissues show small differences between animal and animal there will be a process of selection which will enable those animals with cells of a certain quality to survive the change and to produce offspring which will, on the average, possess the same qualities as the parent. The thesis is based on the belief that the environment is the organic influence in tissue change ; the environment changes first and " consequently the qualities of the cells required for survival are rather different in their various degrees than was the case before the environment was changed ". The author asks, " how from a limbless animal [fish] has the limbed amphibian arisen ? " we know that the terrestial fore-limb is fore-shadowed in the pectoral fin of the crossopterygian fishes and notably in *Sauripterus Taylori* from the Upper Devonian. By " limbless " the author evidently means a non-terrestial limb. The emergence of the

primitive amphibian to a sub-aerial medium already existing is an environmental change, and we are safe in saying that such a state is similar to one in which the environment had changed before the transition from aquatic to terrestial habit had happened. Such a change of environment necessitated a complicated series of readjustments including the strengthening of the supporting structures. It is the process by which change is effected which the author explains as the responses of the component tissues to the injurious effects of wear and tear and altered stresses and strains. The most interesting and authoritative section of the essay refers to the evolution of the mammalian labyrinth. As the author points out " an organ or structure may and often does undergo involution while the species as a whole is undergoing evolution ".

The views expressed in this book are of considerable interest, and, although original, and perforce hypothetical, do not appear to cut across those held by contemporary evolutionists. The author tackles the problem of mechanism of change rather than the trend of changes demonstrated by the study (palaeontological and otherwise) of the finished products.—C. HORTON SMITH.

SISSON, S. [S.B., V.S., D.V.Sc. ; Late Professor of Comparative Anatomy in the Ohio State University, Columbus, Ohio ; Member of the American Association of Anatomists ; Fellow of the American Association for the Advancement of Science]. [Revised by] GROSSMAN, J. D. [Professor of Veterinary Anatomy in the College of Veterinary Medicine, the Ohio State University, Columbus, Ohio]. (1938). **The Anatomy of the Domestic Animals.** pp. 972. 770 figs. Philadelphia & London : W. B. Saunders Company. [3rd Edit.] [4to] [55s.]

This new edition does not differ in general from the previous one, except that a section on the anatomy of the chicken has been added—a wise innovation. In detail, however, the book has been much improved, chiefly by some new photographs of dissection preparations of the ox. This is very welcome at the present time, when the horse is losing its pre-eminent position as a subject of anatomy teaching.

As the leading book in English on animal anatomy, it is indispensable to the veterinary student, just as the earlier editions have been in the past.—J. E.

SCHMALTZ, R. [Dr. med. vet. ; bis 1928 Professor der Anatomie an der Tierärztlichen Hochschule zu Berlin]. (1939). Atlas der Anatomie des Pferdes. II. Topographische Myologie. [**Atlas of the Anatomy of a Horse. II. Topographic Myology**]. pp. 96. 62 plates. Berlin : Richard Schoetz. [5th Edit.] [4to] [RM. 28].

The plates of this new edition are the same as those of the 1922 edition but the transparent line-drawing pages superimposed on the plates have been re-worded when necessary to bring the anatomical nomenclature up to date.

This splendid aid to dissection can easily be used by people of all nations, as the terms are in Latin and there are only a few footnotes in German.—J. E.

MCCOY, Elizabeth [Dept. Agric. Bact., Univ. Wisconsin], & MCCLUNG, L. S. [George Williams Hooper Foundation for Med. Res., Univ. California]. (1939). **The Anaerobic Bacteria and Their Activities in Nature and Disease. A Subject Bibliography.** (In Two Volumes). pp. xxiii + 295 and pp. xi + 602. Berkeley : University of California Press ; London : Cambridge University Press. [4to] [50s.]

In this work the authors have attempted to compile a full bibliography of anaerobes and anaerobic diseases, from the earliest years of the literature up to

1937. The first volume deals with the matter in chronological order, starting at 1816, and full titles and references in each year are in alphabetical order, authors' names being in heavy type. The second volume is classified elaborately into subjects, and the entries under each subject-heading are in yearly groups, each group being in alphabetical order and including authors' names, journal references, and year date, but not the title of the paper; to find the title, volume I must be consulted.

The main subject-headings are :– habitat or occurrence; culture methods; morphology; metabolism; products of metabolism; physiology; serological studies; disease relations, and classification. Finally, there are extra sections on :– bulletins of institutes which report new data; a list of monographs and review articles; references of personal interest on persons whose work on anaerobes is well known; patents of anaerobic processes, etc.; theses, and a full list of all anaerobes by name. There is also a subject index.

The volumes are printed in typewriter characters on smooth paper, and leave nothing to be desired on the score of clarity and convenience in handling, although certain improvements are desirable in supplementary volumes, which will be produced if the demand makes it practicable. In the subject volume there is only a barely discernible half line space between the year groups: it would be an improvement if the year date were inserted in heavy type, adjacent to the first entry in each year group. From the veterinary point of view, also, there are certain criticisms to be made. In the first place, the various anaerobic infections in the different animals are not dealt with separately, but are simply grouped all together under the headings " Tetanus ", " Botulism " and " Gangrene ", mixed up with analogous human infections. Thus it would be a very tedious task to collect references to blackleg from this publication. Secondly, many quite important veterinary periodicals have been omitted from the list of those searched, so it follows that many references have been overlooked [this has been verified by consulting *Index Veterinarius*].

These criticisms do not imply that the bibliography as a whole is not to be recommended. On the contrary, the authors are to be congratulated on a very fine piece of painstaking work, and it is hoped that they will be encouraged to continue the work.—J. E.

—. (1938). Livro jubilar do Professor Lauro Travassos. Editado para commemorar o 25° anniversario de suas actividades scientificas (1913-1938). **[Collection of Papers on Parasitology and Zoology to Commemorate the 25 Years' Scientific Work of Professor Lauro Travassos, 1913-1938]**.—pp. xx + 589. Numerous figs., plates, tables, graphs. [Numerous refs.] Rio de Janeiro: Instituto Oswaldo Cruz. [8vo] [In English, French or Portuguese].

This Festschrift contains some 80 articles by friends of Professor Travassos on zoology, and chiefly helminthology. Some of them are of veterinary interest, and these are noticed in *Index Veterinarius* and in the *Veterinary Bulletin*. There is a biography of Travassos and a complete list of his published works.—J. E.

Faré, C. [Docteur-vétérinaire de la Faculté de Médecine de Paris et de l'École vétérinaire d'Alfort]. (1939). Éléments de matière médicale homoeopathique vétérinaire. **[The Elements of Veterinary Homoepathic Materia Medica]**. pp. 154. Paris: G. Doin & Cie. [8vo] [Fr. 20].

The book is on the subject named, and follows the usual procedure of its advocates, including an account of about 100 drugs and their use in veterinary practice.—J. E.

Addresses of Bureaux.

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Rothamsted Experimental Station, Harpenden, Herts., England.

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King's Buildings, West Mains Road, University of Edinburgh, Scotland.

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IMPERIAL FORESTRY BUREAU,
39, Museum Road, Oxford, England.

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

The latest list of the publications indexed for this purpose was included in *Index Veterinarius*, Vol. 6, No. 1 (issued December, 1938) and also circulated with the *Veterinary Bulletin*, Vol. 9, No. 1.

About 10,000 references are indexed each year, each reference being suitably cross-indexed alphabetically under subjects and under names of authors.

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The dates of issue of the two numbers of each volume are as follows:—

No. 1.—Issued December. Indexing period previous January—June.
No. 2.—Issued June. Indexing period previous July—December.

Vols. 1 to 3 (1933, 1934 and 1935) of the Index were produced on a duplicator; from Vol. 4 onwards it has been printed.

Vols. 1 to 5 were issued in quarterly parts; the issue is now half-yearly.

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